THE OIL WEEKLY

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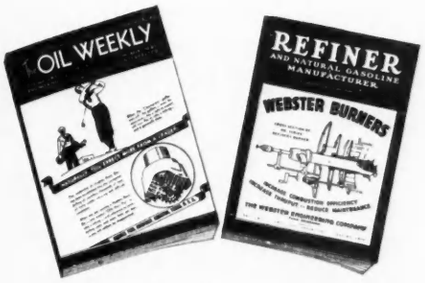

SPECIALIZED OIL JOURNALS
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The Oil Man's Calendar

JAN.	
15	**Illinois-Indiana Petroleum Association, Woodworth Hotel, Robinson, Illinois.**
24	**Governor Marland's Petroleum Conservation Conference of Oil State Governors, Hot Springs, Ark.**
FEB.	
14-15	**Kansas Oil Men's Association, Annual Convention and Exposition, Hotel Broadview, Wichita.**
14-18	**American Institute of Mining and Metallurgical Engineers, Annual Meeting, New York.**
17-18	**Mid-Continent District, American Petroleum Institute, Division of Production, Herring Hotel, Amarillo, Texas**
MAR.	
16-18	**Annual Meeting, American Association of Petroleum Geologists, Roosevelt Hotel, New Orleans, La.**
23-25	**American Society of Mechanical Engineers, Los Angeles, Calif.**
24-25	**Southwestern District, A.P.I. Division of Production, Spring Meeting, Blackstone Hotel, Fort Worth, Tex.**
APR.	
13-15	**Petroleum Industry Electrical Association, Rice Hotel, Houston, Texas**
19	**American Petroleum Institute, Division of Production, Pacific Coast District, Spring Meeting, Biltmore Hotel, Los Angeles, Calif.**
28-29	**American Petroleum Institute, Eastern District, Division of Production, William Penn Hotel, Pittsburgh, Pennsylvania.**
MAY	
11-13	**Natural Gasoline Association of America, Hotel Tulsa, Tulsa.**
12-14	**National Oil Scouts Association of America, Tulsa, Oklahoma.**
14-21	**International Petroleum Exposition, Tulsa, Oklahoma.**
23-25	**American Petroleum Institute, Wichita, Kansas.**

Contents « January 10, 1938

Volume 88, Number 5

The Changing Panorama.....9 and 10

General News.....11 to 17

Legislative Affairs 11

Oil in the Courts..... 12

Proration Picture 13

Labor Situation 15

Hope Prevails Despite Uncertainties..... 16
BY L. J. LOGAN

Men in the Industry's News..... 51

Squeaks from the Bull Wheel..... 97

Engineering and Technical.....17 to 50

Geology and Petroleum Development of the Western Kentucky Basin 18
BY GEORGE R. WESLEY

Obtaining Maximum Production Through Efficient Operation of Sub-Surface Pumping Equipment, Part 1..... 22
BY DON E. SCHNORRICH

Establishing High Pumping Potentials in Western Kansas..... 32
BY FRANK B. TAYLOR

Gulf Coast Microscopic Methods..... 44
BY M. M. KORNFELD

Markets and Statistics.....55 to 57

World Developments 58

Pipe Line News..... 61

Index to Field Developments..... 62

New Products and Manufacturers News..... 93

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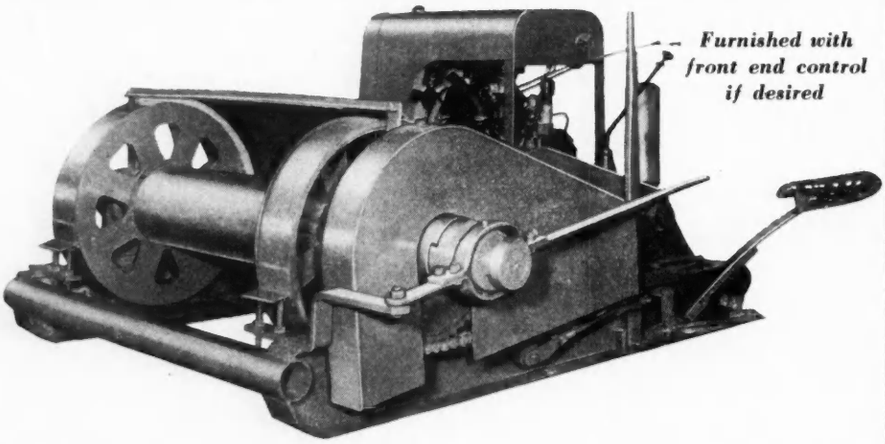

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LOOKING AHEAD

WITH THE EDITOR

K-M-A comeback puts it in major field class . . . New developments that advance efficient pumping.

NEXT WEEK: Our story of K-M-A—the field that came back after 18 years.

The latest boom in the oil industry is at K-M-A, just outside of Wichita Falls. It is regarded as the largest discovery in area and drilling possibilities since the champion of them all—East Texas. Soon it will be the most active drilling spot in the state. And because of the vast area, approximately 40,000 acres at this moment, drilling work should continue over a number of years.

Just how big an area the new deep pay at K-M-A covers no one knows. Neither do they know the probable ultimate recovery of the region as yet, or the number of wells that will be drilled.

Therefore, our presentation of facts as they are today at K-M-A, plus a discussion of its possibilites, along with the operating and producing methods will be of great importance. It is to be amply illustrated with maps and photographs.

IF you will read Part 1 of "Efficient Operation of Sub-Surface Pumping Equipment" in this issue, we feel certain you will find it of interest and practical value, and that you will be looking forward to the second installment. The second part will appear in THE OIL WEEKLY of January 17. It will continue a discussion of the new methods and procedures that have been developed recently, which are expected to advance efficient and trouble-free operation of sub-surface pumping equipment under both normal and extremely adverse conditions.

The changing panorama

THE trial of a group of oil companies at Madison on charges of anti-trust law violations, at last is nearing termination. It began October 4. When the trial was resumed after the New Year holiday, the court revealed that attorneys for both sides had indicated evidence would be completed within 10 days or 2 weeks. Then, after final arguments and the court's instructions, the case will go to the jury.

Congress Regarded as Conservative

Business interests are reconciled to facing a renewed reform drive in the present session of Congress, in consequence of recent anti-monopoly speeches of administrative spokesmen. But it is felt that Congress itself will prove conservative when acting on the various proposals for regulating business.

Hopefulness Expressed

Probably typical to a great extent of the feeling among oil company executives was that expressed recently by Edward G. Seubert, president of Standard Oil Company of Indiana, in a year-end statement.

On nearing 1938, he said, the oil industry was "wrestling again with the old law of supply and demand. . . . Refiners have piled up stocks of gasoline as result of their effort to supply a disproportionately large market for domestic fuel oil. The effect on the market is not constructive."

"We hope," he continued, "that immediate difficulties may prove to be temporary and that the industry may find the new year as satisfactory in net results as was the year just ended."

Refiners' Adverse Position Cited

The comparatively unfavorable position into which the refining branch of the industry had slipped was commented upon by President Boggs of the Western Petroleum Refiners' Association.

"The refining industry of the Mid-Continent area looks back upon 1937 as a year in which record quantities of petroleum products were sold at prices far below the cost of refining," he said.

The Mid-Continent refiners supplied almost one fourth of the nation's motor fuel requirements, he stated, but the prices obtained by the refiners were 30 to 40 percent below the cost of manufacture.

Further losses or complete shut down of refineries may be expected, Boggs declared, "unless the costs of crude oil and labor are reduced or unless the market for refined products is improved."

Among the products that were used more extensively in 1937, he said, were lubricants, heavy industrial fuels, asphalt, and road oil.

Gasoline Prices Depressed

The disparity between gasoline prices and crude oil prices, mentioned by the head of the refiners' association, still exists.

Gasoline tank car prices at the refineries now are lower than a year ago, while crude oil prices are about 10 percent higher than a year ago.

Furthermore, it appears that the unbalanced situation cannot be corrected now by the change that would be most desirable: a marking up of gasoline prices. For the gasoline market is burdened by substantially excessive stocks, and in the next several months it is to be expected that there will be difficulty in keeping those gasoline inventories from getting even farther out of line with market requirements. In meeting the heavy demand for light fuel oils for domestic heating, the refiners are turning

Oklahoma's first discovery of 1938, and considered by many the most important strike in more than a year in the state, is Mid-Continent Petroleum Corporation et al's Ramsey 1, SWc NW 18-18n-2e, southwest of Stillwater in Payne County. The well flowed 10,000 barrels from what is believed to be the second Wilcox sand. It is more than 10 miles from nearest production.

out, from the crude processed, more gasoline than the market can absorb.

Thus the other alternative for correcting the disparity between gasoline and crude oil prices, namely crude price cutting, seems more likely to be called upon, if any price changing occurs.

Crude Control Strict

Nevertheless, producers still are hoping that lower crude postings can be avoided.

Furthermore, the producing division of the industry has been mixing determined efforts and cooperation with its hopes, having reconciled itself in recent months to exceptionally strict crude allowables.

In the four closing months of 1937 crude output was held well below market requirements, under unusually strict state allowables, and it was possible to make substantial reductions of crude oil stocks.

That drastic curtailment of crude output undoubtedly did much toward preventing a threatened decline of crude oil prices.

Similarly, it now is hoped that strict crude control can continue to save the existing crude price postings.

Oil Burner Shipments Lower

Shipments of oil burners in recent months have not been as heavy as in the similar months the previous year. Presumably, this reflects a slowing down in construction of homes and apartment houses.

In the fore part of 1937, however, oil burner sales were larger than in the corresponding part of 1936.

Consequently, despite the slowing of sales lately, the shipments for the first 11 months of 1937, totaling 184,841 burners, were practically the same as in the similar period of 1936, when 185,577 burners were shipped.

In November, 1937, the shipments of oil burners amounted to 10,446, as compared with 16,347 in November, 1936, and with 10,049 in November, 1935.

These statistics refer to oil burners and oil burner units consuming fuel oil of commercial Standard No. 1 grade, or heavier, used for application to central heating plants for homes, apartments, office buildings, churches, theaters, and similar buildings; to industrial process equipments such as heat treating furnaces, industrial ovens, etc.; and for generation of steam for power. The statistics in the report do not, however, include burners used in ranges, stoves, water heaters, and space heaters, which are shown in a separate release entitled, "Distillate Oil Burners."

In the latter report it was shown stated that shipments of distillate burners in November fell to almost half the number shipped in November, 1936, although shipments for the first 11 months of 1937 were much larger than in the same period of 1936.

The November shipments of those burners numbered 36,298, compared with 67,452 in November, 1936, and with 47,954 in November, 1935. For the first 11 months of 1937, shipments totaled 452,633, compared with 385,285 in that period of 1936 and with 247,580 in the like period of 1935.

Drilling

OKLAHOMA started 1938 with discovery of a new Wilcox sand pool in Payne County, 7 miles southwest of Stillwater. In the southern part of the state a deep test in the Milroy-Fox area flowed 374 barrels in 23 hours from Oolitic lime at 7680-7783 feet.

Kansas reported no new pools, but a wildcat 4 miles southeast of Zurich pool in Rooks County cored saturation at 3363-70 feet in Kansas City lime. Whelan pool of Barber County was extended a half mile northwest.

In Nueces County, South Texas, a 5812-foot well discovered the West Saxet field. Deepest production on the coast of this district was afforded at 7703 feet by a Refugio well. North Sweden field, Duval County, was extended northeast by a well which opened a new Jackson sand lens, and the new 4500-foot zone in this field is being materially extended.

A wildcat on Timbalier Bay in La Fourche Parish, indicates it will open South Louisiana's first field in 1938. Another in Jefferson Davis Parish looks like a field opener.

On the Texas Gulf Coast a wildcat in Matagorda County cored saturation. A new sand was found at Palacios field at 9240 feet. Old Ocean was extended three-quarter miles southeast by a 10,676-foot well, and a test 2½ miles northeast of Fairbanks cored oil sand.

An Illinois wildcat prepared to test a Cypress sand found at 2470 feet. A Wabash County wildcat showed oil at 2575 feet; oil heretofore produced in the neighborhood has come from around 2000 feet.

Market briefs

Outlook—Conditions remain unsettled.

Crude Markets—Still holding.

Refined Oil Markets—Gasoline market continues weak.

CURRENT OPERATIONS

Week Ended	Daily Crude Production	Daily Crude Runs to Stills
January 1	3,436,600	3,320,000
Previous week	3,492,600	3,245,000
Year ago	3,129,950	3,030,000

CRUDE STOCKS

Date	Crude Oil (Barrels)
December 18	303,041,000
Week before	303,034,000
Year ago	288,184,000

REFINED OIL STOCKS

Date	Gasoline (Barrels)	Gas & Fuel Oil (Barrels)
January 1	77,291,000	118,660,000
Week ago	74,437,000	118,659,000
Year ago	62,661,000	106,330,000

DRILLING

Period	Wells Completed
Past week	438
Previous week	453
Year ago	442
Year Total:	
This year	891
Last year	860

Technology

RECENT discoveries of oil in the Illinois portion of the Eastern Interior Basin has given impetus to an extensive leasing program, which has spread into the Kentucky part of the basin. The geology of the Western Kentucky Basin is not materially different from that of Illinois states George R. Wesley in an article discussing the history, geology and economic outlook of the territory. His interesting article starts on page 18.

A number of new methods and procedures that advance efficient and trouble-free operation of sub-surface pumping equipment under both normal and extremely adverse conditions have been developed recently. These are described in a series of three articles by on E. Schnobrich, the first of which appears on page 22. It will be found of practical value.

Because the majority of wells in Western Kansas depend on pumps to lift the oil, operators in the area demand maximum service in order to establish high potentials. Some unusually high production has been obtained in this manner. The various types of equipment in use for this purpose is the subject of an article on page 32 that is written by Frank B. Taylor.

The careful study of well samples from the grass roots down will enable geologists to determine the presence or absence of structures. Therefore the description of "Gulf Coast Microscopic Methods" by M. M. Kornfeld is of interest and importance. It may be found on page 44.

Legislative Affairs

President asks new Congress to modernize anti-trust laws, pass wage and hour bill, and to ease tax burden on undistributed profits . . . House tax committee decides not to consider revision of depletion allowance.

WITH the opening of another session of Congress, legislative possibilities became a subject of importance last week. In his address, the President asked Congressmen to give consideration to several matters of interest to the oil industry. His annual budget message included items pertaining to petroleum also. Meanwhile, of outstanding significance was the action of the House Ways and Means Tax Subcommittee in deciding not to consider revision of the depletion provision of the revenue law, which had been expected to be the most vital petroleum congressional matter during this session.

Points Sought by Roosevelt

Modernization of the anti-trust statutes, the enactment of a moderate wage and hour bill and the amelioration of burdens imposed by the undistributed profits tax were outlined by President Roosevelt this week as the major industrial matters which should be given consideration by the new session of Congress.

The need for these legislative enactments as a basis for the restoration of prosperity was emphasized by the President in his annual message January 3, in which he made it clear that the Administration considers industrial and agricultural recovery more important than the immediate balancing of the budget.

Insists on Wage-Hour Bill

That the Administration has not abandoned its drive for the enactment of wage-hour legislation, even in the face of the 216 to 198 vote by which the measure was sent back to committee last month, was made plain by Mr. Roosevelt, who criticized those segments of industry which have opposed the measure and declared it to be "an essential part of economic recovery." His demand for revival of the bill was based on the premise that nothing permanent can be accomplished by raising the purchasing power of the farmer, provided for in legislation now pending, unless that of the industrial worker also is raised.

In the field of tax relief, the message laid down the principles to be followed by Congress in considering the legislation on which the House Ways and Means Tax Subcommittee worked during the special session.

"In relation to tax changes," it was said, "three things should be kept in mind. First, the total sum to be derived by the federal treasurer must not be decreased as a result of any changes in schedules. Second, abuses by individuals or corporations designed to escape tax-paying by using various methods of doing business, corporate and otherwise—abuses which we have sought, with great success, to end—must not be restored. Third, we should rightly change certain provisions where they are proven to work definite hardship, especially on the small business men of the nation. But speculative income should not be favored over earned income.

"Our conclusion must be that while proven hardships should be corrected, they should not be corrected in such a way as to restore abuses already terminated or to shift a greater burden to the less fortunate."

Much of the message was devoted to the question of monopoly, the recent attacks of Robert H. Jackson, Assistant Attorney General in charge of anti-trust enforcement, Secretary of the Interior Harold L. Ickes and other Administration officials being defended as showing the need for controlling the activities of those few business and industrial organizations which are seeking monopolistic control of the nation.

Misuse of Patents

While naming no industries or organizations specifically, the President cited practices which have been employed in many instances, among them the misuse of patent laws, unfair competition to drive the small competitor out of business locally and regionally, and excessive capitalization and security manipulations.

Mr. Roosevelt also called attention to concentration in industries, many of which, he declared, "cannot be justified on the ground of operating efficiency, but have been created for the sake of securities profits, financial control and the suppression of competition."

In some industries, he said, this concentration has progressed so far that "a very small numerical group is in such a position of influence that its actions are of necessity followed by the other units operating in the same field."

House Opposes Depletion Change

By a vote of 6 to 2, the House Ways and Means Tax Subcommittee January 6 decided not to give consideration to revision of the depletion provisions of the revenue law.

The reduction of depletion allowances was asked by secretary of the Treasury Morgenthau, who charged that they now deprive the government of 75,000,000 a year in tax revenues.

The subcommittee is expected to make its report to the full committee by the middle of the month, and that body, of course, can go into the question of depletion if it desires, during the framing of the new bill. However, it is expected the full committee will follow the recommendations of the tax group.

Oil and National Budget

Current depressed industrial and economic conditions will have a marked effect upon Federal revenues from oil taxes, it was disclosed by figures submitted with President Roosevelt's annual budget message to Congress January 5.

A $5,000,000 loss in gasoline tax collections during the fiscal year beginning July 1, next, is foreseen by Treasury actuaries, bringing the total down to $201,000,000 from the $206,000,000 which it is anticipated will be received during the current fiscal year.

The other oil taxes also will be reduced, it was indicated, revenue from lubricating oils, estimated at $31,400,000 for the current year, being placed at $30,200,000 for the coming year; pipeline transportation dropping from $10,500,000 to $10,300,000, and the processing taxes, if not repealed as now proposed, dropping from $870,000 to $860,000.

On the other hand, the Interior Department expects a $500,000 increase in its receipts under the mineral leasing acts, estimated at $6,000,000 for the current year and $6,500,000 for the fiscal year 1939, while the Navy Department expects $850,000, the same as estimated for this year, in royalties from the California naval petroleum reserves, and royalties on oil, gas, etc., are expected to amount to $40,550 as compared with $41,050 estimated for the current twelve-month.

Estimates of appropriations submitted by the President show that a fund of $285,000 will be asked for the Petroleum Conservation Division of the Interior Department, the same as the appropriation for the current year, but that actual expenditures are figured at $5000 less, on the basis of estimated expenditures this year of but $256,500. The Bureau of Mines is to be given $260,000 for oil and gas investigations, an increase of $7000 over the present fund, and is not expected to save much of anything.

An increase of $7500 is contemplated for operation and conservation of the naval oil reserves by the Navy Department, the estimate jumping from $62,000 to $69,500, but it is hoped actual expenditures will not exceed $65,000.

Oil in the Court

"Master Mind" denies conspiracy as trust trial at Madison nears jury . . . Texas proration upheld by Supreme Court . . . Plan more Elk Hill prosecution

DEFENSE attorneys in the anti-trust prosecution of major oil companies and individuals were bringing their presentation to a close as court adjourned at Madison last week, which caused hope that they may be able to rest their case this week, and see a jury determination of their guilt or innocence of charges of conspiring to fix gasoline prices before the end of the month. The trial opened over three months ago.

Other legal matters of import last week was the refusal of the United States Supreme Court to review a lower court decision that upheld Texas proration laws in which the state's enforcement body had been charged with negligence because some operators allegedly did not follow production allowances.

It was indicated last week that further prosecution in the Elk Hills oil cases could be expected during the fiscal year starting July 1.

"Head Man" testifies at Madison

Interest at Madison was centered in the testimony of Charles E. Arnott, who early in the trial was characterized by prosecution attorneys as the "master mind" of the alleged conspiracy. Arnott resigned the presidency of Socony-Vacuum Oil Company in 1933 to accept a vice presidency, which would permit him to devote his activity to stabilization efforts under the NRA petroleum code.

Called as a defense witness, Arnott refuted a government contention that the East Texas Refiners Marketing Association was organized in furtherance of the alleged conspiracy. He said he had not heard of the association until Neil Buckley came to him at Pinehurst, N. C., early in 1935 in an effort to obtain major company business for independent refiners who had decided to reform from practices of running hot oil. Buckley, an employe of Cities Service Export Oil Company, is described in the indictment as "acting in a liaison capacity between the association and the defendant major oil companies" and is also said to have "instigated" purchases by majors from independent East Texas refiners.

During Arnott's testimony, minutes of a meeting held at Washington early in March, 1935, at which the buying plan was outlined to district allocators brought together by the Federal Planning and Coordination Committee established under the code, were read to the jury. They revealed that distress gasoline in the Mid-Continent and in East Texas, areas concerned in this case, was not the only concern of the industry, but that a representative of the Gulf Coast was also in attendance, as was a representative from a New York group that had met a week earlier in an effort to find a way to dispose of the surplus in that region.

Arnott described the buying plan to code officials, explaining that it was evolved after a meeting held in Chicago January 4, 1935, at which small refiners complained that nothing had been done for them under the code. The small refiners maintained that as long as the administration insisted on a $1-a-barrel posted crude price and no improvement was made in the tank car price structure, they would be forced to close their plants or withdraw from observance of the code. The plan was brought to Arnott's attention, according to the transcript of the meeting, by R. W. McDowell, vice president in charge of sales for Mid-Continent Petroleum Corporation, and H. T. Ashton, manager of the Lubrite Division of Socony-Vacuum Oil Company, who described it as a "wise and reasonable" recommendation.

It was pointed out that regular buyers of gasoline in the Mid-Continent field could remove distress gasoline from the tank car market and assist the small refiner if they were advised where distress gasoline could be obtained. It was recommended that the sub-committee established by Arnott a month previous, and of which McDowell and Ashton were members, put known buyers in contact with sellers, conducting surveys among major companies and small refiners for the purpose. The buyer and seller were to conduct their own price negotiations, the committee's only interest being that "the fair going market price" be paid. The plan, which was not to be placed in effect until the hot oil situation had been placed under control with effective date of the Connally act (March 1), called for no buying pools, no contract commitments, no quotas for either major companies or small refiners and was purely voluntary. Arnott's only connection with the program after it got underway in the spring of 1935 was an occasional memorandum from the sub-committee during the code period on the amounts of surplus gasoline, and after invalidation of the code he received no more reports but understood the plan was being continued on a voluntary basis.

Frequent Clashes

The week's sessions were again punctuated by frequent clashes between opposing counsel. Before Arnott was called to the stand, Presiding Judge Patrick T. Stone inferred that subordinates in the code administration were "derelict in their duty" if they knew that actions that might be violations of the Sherman anti-trust act were being performed and did not report on them to their superiors. His statement was in reference to Dr. J. W. Frey, a member of the Petroleum Administration Board, who a week ago testified that Arnott reported the buying program to the board early in 1935, but that Frey did not personally report to Petroleum Code Administrator Harold L. Ickes because that was the function of the P.A.B. chairman, Charles Fahy. Judge Stone declared that one in the position of Dr. Frey "ought to quit his job or perform his job," and inferred that enforcement machinery that resulted in the indictment now being tried should have been set in motion in 1935, instead of 1936.

A certification was obtained from Ickes on Wednesday that defined Frey's duties and was brought to Madison by plane overnight by a member of the defense counsel staff. The certification, which prosecution attorneys unsuccessfully battled for several hours to keep from the record, gave Frey "unusual lattitude for independent and unreviewed administrative and executive action and decision" and proclaimed him to have "full responsibility for the success or failure of duties assigned to him" as head of the marketing division under the code. It was obtained to refute prosecution arguments that Frey was a minor official without power. Frey, as a defense witness, had testified that he did not, nor did any other code official to his knowledge, order Arnott to halt the voluntary buying program.

Arnott, who was on the stand as a defense witness for 11 hours, denied that he defied the authority of the Petroleum Administration Board in inaugurating the program and said he was of the opinion that both Fahy and Frey approved of the distress gasoline purchases. He said that no member of the board ever asked that the program be discontinued and denied that he told the board he was going ahead on his own responsibility and did not seek the approval of the board.

Introduce Letter From Ickes

During cross examination by Hammond E. Schaffetz, a letter described as defining the limit of authority conferred upon Arnott by what has since taken on the designation "The Famous Ickes Letter," was introduced over the objection of defense counsel. Dated April 2, 1935, it was objected to because the code administrator's letter of July 20, 1934, which the defense claims gave Arnott complete authority to engage in activity for stabilization of the industry was refused admission. The court has repeatedly sustained a government objection that the first letter referred only to retail price wars and did not give Arnott authority to inaugurate a buying program for distress gasoline then disturbing the Mid-Continent and East Texas spot markets.

In the second letter, Ickes asked Arnott whether major companies were purporting to act under authority of the first letter in connection with moratoriums on dealer accounts on which complaints had been received. Ickes pointed out the necessity of complying with basic laws.

Just before court adjourned for the week, Chaffetz attempted to make Arnott say that major companies would

not have participated in a program of distress gasoline purchases on through the months of 1935 if tank car markets had not improved. Repeated questioning on this point brought only the explanation that majors would have purchased gasoline that they needed, as they had always done. Arnott had previously testified that the buying was on a voluntary basis and that no quotas were set, nor was any major required to make purchases.

Using a series of charts, Fred Van Covern, defense witness qualified as a statistical expert, testified that major company purchases of distress gasoline could have had only a temporary and incidental effect upon the market and did not force prices higher than they would have gone if normal demand were permitted to take its course. Factors which he attributed to the rise in gasoline prices were low inventories and withdrawals of crude oil from storage, the interstate compact of 1935, the unprecedented demand, and the Connally hot oil act.

Supreme Court upholds Texas proration decision

The United States Supreme Court January 3 refused to review a decision of the Fifth Circuit Court of Appeals holding that the Texas Railroad Commission had not been negligent in affording protection under its proration orders to Angus Spear and Thomas D. Humphrey, operators in the East Texas field.

The operators had complained that while they obeyed the production limitation orders issued by the commission, their neighbors did not, but flagrantly and grossly overproduced, causing extensive damage to them. They further complained that the commission, charged by law with the enforcement of the proration orders, did not in fact compel obedience of the law by their neighbors, though knowing of the violations.

The petitioners sought from the district court an injunction against the enforcement of the proration orders while they sold and removed certain oil which they had produced and stored in excess of their quota—allegedly only after they had obeyed the proration law for years and had exhausted every effort to have the commission enforce the law.

The district court held that the operators had been denied equal protection and were entitled to the relief asked, but its decision was reversed by the Circuit Court of Appeals, which held that unless the petitioners could show that the conceded failure of the commission to enforce the law was a negligent or willful act, done with an evil intent, there was no denial of equal protection, observing that the failure to enforce was caused by lack of funds and inadequate statutory penalties.

In appealing the case to the Supreme Court, the petitioners contended that, whatever the cause, the failure to enforce the law constituted a denial of equal protection within the meaning of the Fourteenth Amendment to the Constitution, and claimed that the Circuit Court erred in ruling that no denial of equal protection results when a gross inequality in the operation of a state statute is caused by the weakness of the enforcement provisions of the statute, rather than by willful and negligent action of the enforcement officers.

Further Elk Hills prosecution

Further prosecution of the Elk Hills oil cases by the government during the fiscal year beginning July 1, next, is provided for in the independent offices appropriation bill taken up by the House of Representatives January 6, in which is carried a fund of $34,000, the same as provided for the current year.

Department of Justice officials appearing before the House appropriations committee during hearings on the measure explained that a judgment in favor of the government was entered last month in its action against Standard Oil Company and others, in which the land involved, Section 36, was ordered returned to the United States and a money judgment of $6,164,102 was also awarded the government.

The defendants to the suit have announced their intention of appealing the decision and the government, it was revealed, intends to take a cross-appeal on the question of interest, which was not allowed, and with respect to certain offsets amounting to approximately $2,000,000 that were not allowed to the defendants.

It is expected that the case will go through the Circuit Court of Appeals and eventually find its way to the United States Supreme Court.

The other case, involving Section 16, is pending before the Commissioner of the General Land Office on appeal. If the government is successful before the department, an action will be instituted to recover possession of the land, but there will be no money judgment involved since no oil has been discovered.

Inquiry by members of the committee as to the outcome of the Doheny case developed that while the Doheny interests took $15,000,000 out of the properties which it was later held they obtained unlawfully, the government has recovered $31,000,000.

Proration Picture

Roosevelt recommendation for voluntary production control hedged with restrictions . . . Allowables in Texas fields increased, field rules are issued

A RECOMMENDATION by President Roosevelt for voluntary production control in the oil industry, an increase in allowables for several Texas fields, issuance of regulations for several Texas pools, and postponement of rules for the Schuler, Arkansas, field were proration actions last week. Meanwhile, several important meetings, such as the Texas statewide hearing, the Interstate Compact Commission and a conference of governors of oil producing states were in the offing.

Roosevelt and Production Control

In recommending voluntary production control for oil and other major industries last week, President Roosevelt stated he wanted such actions safeguarded by strong anti-monopoly laws.

The suggestion, however, was so hedged about with restrictions, such as prohibitions upon price fixing, elimination of competition or allocation of production, as to raise the question of how effective the mere compilation of statistical data would be to meet changes in the industrial situation.

As outlined by Mr. Roosevelt, who emphasized that he was not advocating reenactment of the NRA, representatives of the various industries would gather with government officials for the discussion of business trends and the determination of probable consumptive demands for various commodities for a given period in the future.

The President, discussing the proposal with newspapermen, gave no indication how seriously he was considering it or whether he proposed to discuss it further in the monopoly message he is shortly to send to congress.

Reaction to the projected production control was varied, with adverse comment from industrialists who, under the NRA control, found their operations restricted to what they considered an unfair degree as compared with competitors, and from many others who believe that control of output cannot be achieved without allocation of production, which in itself involves elimination of competition and price fixing.

In other quarters, however, the plan was enthusiastically received, endorsements received at the White House including a telegram of approval from Charles F. Roeser, president of the Independent Petroleum Association of America.

So far as the oil industry is concerned, a conference of the character proposed by Mr. Roosevelt was held at the request of the administration in March, 1933, when representatives of the various branches of the industry and of the governors of the oil-producing states estimated the consumptive demand for petroleum products and proposed policies for regulation of supply to meet that demand. The program was submitted to the President through Secretary of the Interior Ickes, and was given approval.

The IPPA has consistently advocated

the enactment by Congress of legislation authorizing industries to make voluntary agreements, subject to the approval of the federal government.

Considerable doubt prevails among industrialists generally as to how the President's proposal can be reconciled with the suggestions which have been offered by administration officials for modernization of the monopoly statutes, since any form of voluntary action between members of an industry, involving either production control or price fixing, now is a violation of the anti-trust laws, and there has been no indication that this restriction is to be removed.

Texas Allowable Increases

The Texas Railroad Commission last week recognized an increasing demand for crude from Texas oil fields. Commissioner Ernest O. Thompson pointed out that the requests for increases constituted evidence that the crude market is becoming firm and intimated that he thought the demand for Texas oil was more stable than it has been during the latter months of 1937.

An increase of 1500 barrels daily in the allowable for Sulphur Bluff field, Hopkins County, became effective on January 3. This raised the field allowable to 4766 barrels per day. An increase for Placedo, effective January 5, raised the allowable for that field 2378 barrels to 9890 barrels, and raised per well allowables there from 52 to 70 barrels maximum.

The Thompson field in Fort Bend County was increased 2000 barrels to 10,183 barrels, effective January 5. The Wasson field in West Texas was raised 840 barrels to 1857 barrels. Bennett was increased 200 barrels to 500 barrels. Harper was increased 745 barrels to 2000 barrels. The new schedules for these fields are retroactive to December 18.

Revised schedules for the Masterson field, effective January 1, increased the allowable 296 barrels to 725 barrels.

East Texas Status

East Texas operators must furnish a report of the status of each well in the field which is not flowing, according to an order issued by the Railroad Commission last week. The new reports must be in the Commission's office at Kilgore by January 15, 1938.

The operators must list all their wells and tell whether each is currently making its allowable. If wells are making water, the report must show the average daily production of oil and water in barrels, as well as the percentage of water produced.

The apparent purpose of the order is to obtain further information showing whether wells in the field are capable of making the allowables which have been assigned to them.

Texas Hearing

Most important subject to be discussed at the statewide hearing to be held in Austin on January 17, will be the state of the Texas crude oil market. At that hearing, operators are expected to present evidence indicating conditions in local fields which will disclose whether Texas is now producing too much oil.

The Railroad Commissioners have announced that they will not issue an order fixing February allowables until after they attend the Interstate Compact Commission meeting, which is to be held in Oklahoma City the following day. For the first time, the Texas Railroad Commission will be represented by C. V. Terrell, chairman, and V. E. Cottingham, director of production, as well as by Compact Commission Chairman Ernest O. Thompson.

Austin observers see in this program the possibility of an effort on the part of Texas officials to obtain more effective cooperation in production curtailment from other large oil producing states which are compact members. Last month Texas cut more than 40,000 barrels, which had been preceded in November by a 100,000-barrel cut. No other state found it necessary to make a proportionate reduction, and at the December hearing several operators protested against Texas carrying the full load.

It is entirely possible that after officials of other oil producing states see the charts which Cottingham has prepared, showing the improved conditions in oil fields where pressure has been carefully maintained, they will understand the value of similar reductions in some fields in their own states.

Texas, of course, could produce far more oil than is being marketed currently, and could produce profitably at prices lower than those necessary for profitable operation in the mid-continent area. The Texas Commission may find that it is necessary to materially increase Texas production unless better cooperation in the curtailment program is obtained from other oil producing states.

K-M-A Field Rules

Ten-acre spacing and 20-acre prorations units for the new K-M-A field in Wichita and Archer counties was provided in an order issued by the Texas Railroad Commission last week. The new rules apply to wells drilled below 3600 feet in the area.

The field is to be divided into 20-acre units, but wells may be spaced 330 feet from lease lines and 660 feet apart. The proration formula provides that "the daily average allowable for each well shall be that proportion of 50 percent of the daily field allowable which the acreage assigned to the well bears to the total acreage assigned to all the wells in the field. The daily per-well allowable, after deductions have been made for wells incapable of making their allowable, shall be determined by dividing 50 percent of the total field daily allowable by the number of producing wells in the field. The total daily allowable shall be the sum of the well's acreage and per well allowable."

The commission will allow as much as 30 acres, a 10-acre tolerance, to be assigned to the final well on any lease, thus eliminating the necessity for drilling an extra well to obtain the full acreage allowance for a tract or unit which contains more than 20 acres.

The rules provide for 100 feet of surface casing, cemented to the surface, and an oil string set with 100 sacks of cement. Wellhead fittings must stand a 1000-pound test.

Rotan Field Rules

Ten-acre spacing for wells in the Rotan field, Fisher County, was provided in an order issued by the Texas Railroad Commission last week. This will permit wells to be drilled 330 feet from lease lines and 660 feet apart.

The order provides for 300 feet of surface casing cemented to the surface, and a 1200-pound test oil string set with 200 sacks of cement. Blowout preventer and other safety devices must be used in the area of the field where a gas cap is known, and all wells must be equipped with a 1000-pound test Bradenhead.

Two and one-half inch tubing is required in flowing wells, and the bottom of the tubing, or the top of the perforations, must be no higher than within one joint of the top of the producing formation.

The field is to be divided into 20-acre rectangular units twice as long as they are wide, and tracts containing between 10 and 20 acres, which were sub-divided prior to September 7, 1937, shall be treated as full proration units. No tract shall be considered less than one-fourth of a unit, and the final unit in any lease, which contains more than 20 acres but less than 40 acres, may be given an acreage allowance up to 25 acres.

Should tracts be sub-divided after September 7, 1937, into units less than 20 acres, they shall be given allowances in proportion to their size.

Half the daily allowable is to be assigned on acreage and half on potential.

The order provides for immediate potential tests of all wells completed prior to January 15, 1938, and wells completed after that date must have a second potential test 6 months after the completion of the first test. Potential tests of flowing wells are to be based on the 24-hour flow through 2½-inch tubing, and pumping wells are to be pumped 24 hours through a working barrel with a maximum inside diameter of 2¼ inches.

The rules provide for a maximum gas/oil ratio of 2000/1, with a total displacement factor for high gas/oil ratio wells.

Penwell-Jordan Separated

A new division line separating the Penwell and Jordan fields in Ector County is provided in an order issued by the Texas Railroad Commission last week. The new line follows the northern boundaries of Sections 25 and 26, Block 16, Public School Lands, and the northern boundaries of Sections 4 and 5, Block 35, University Lands in Ector County.

This division line will be substituted for the Crane-Ector County line which has been used to separate these fields for proration purposes. The effect of the new order will be to include in the Jordan field several wells which have been in the Penwell field up to this time. Since the Jordan field is prorated on a per-well basis, wells in that area will be given higher allowables than they have received while in the Penwell field, especially those which are on units smaller than 40 acres.

The change in the dividing line was requested at a hearing held before the commission on December 29. The University of Texas asked that the line be located as ordered because a saddle separated the fields at that point, approximately.

The plan was opposed by the Gulf and Shell companies, whose engineers argued that the evidence of the exist-

[Continued on page 61]

Labor Situation

Mexican situation is in deadlock as labor board postpones enforcement . . . Farish charges order violates Mexico's laws and threatens withdrawal

WITH labor developments in the United States comparatively quiet last week, most important news on this front was confined to Mexican difficulties.

January will probably close before oil companies operating in Mexico will know whether they must pay the heavy increases in wages and benefits accorded workers through a decision of the Federal Labor Department in Mexico City January 6.

Mexico's labor situation has resulted in a deadlock between the oil companies and those representing the workers, the companies insisting they will be unable to stay in business if forced to comply with the Federal Board of Arbitration's stipulations, the labor syndicates insisting the awards of the arbitration board must be met.

Enactment Suspended

Suspension of the enactment of the Mexican government's ruling in the general oil controversy, involving practically every substantial operator in that country, which was asked by the oil companies in connection with filing their injunction suit in the Federal Supreme Court against the board's verdict, has been granted by the Federal Labor Department. The oil workers syndicates, or unions, have been advised to that effect, though the companies had not been officially advised of such as of January 6.

The suspension of enactment of the verdict, however, demands that the companies post a cash bond sufficient to cover the annual increase in wages stipulated by the arbitration board. The Labor Department put this bond at about 26,000,000 pesos ($7,000,000 U. S. currency).

The Federal Supreme Court's decision on the injunction is not anticipated for at least a month.

Farish States Views

W. S. Farish, active head of Standard Oil Company of New Jersey, parent company of Huasteca Petroleum Company, which is one of the most important companies in Mexico, characterized as unreasonable the conditions set by the Mexican government in imposing price, labor and management restrictions on private enterprise there.

Costs and expenses have progressively risen, whereas the government has held the oil industry's selling prices constant, Farish pointed out. "Restrictions have not only made operation at a profit extremely difficult and, in many cases, impossible, but have created conditions in the industry so precarious that new investment in Mexico has seemed undesirable. Past investment is seriously threatened; no hopes of improvement are offered.

"This deplorable condition," Farish stated, "has been made more extreme, to the extent of becoming unbearable, by the recent award of the Mexican Labor Board which imposes on the companies an outright basic pay increase of over 40 percent and, in addition, obligations for the support of labor, the costs of which are in some cases impossible to calculate."

Illegal Procedure

The cost to the companies of meeting the added expenses would be at least 41,000,000 pesos, Farish said, and inferred that "it could easily reach 50,000,000 pesos."

It is estimated that retroactive application of the terms of the award would eventually cost the oil industry in Mexico 24,000,000 pesos, whereas, Farish stated, "average net profit of the industry in Mexico during the past three years has been approximately 22,750,000 pesos."

Mexican law was violated in reaching the decision of the labor board, Farish declared. "The publicly announced objective of the board was to determine how much burden the companies could stand—not what were the general conditions of labor in Mexico or the proper rate of pay for oil labor in Mexico.

"This unprecedented theory of fixing costs and conditions was carried into effect by taking the industry as a whole and arbitrarily distorting the accounting figures of individual companies into a consolidated total for the industry. Under terms of the award the companies could not operate at a profit, even with the utmost economy in management."

Threat of Withdrawal

Farish claimed that the board's award set the climax to a series of impositions under which the companies can no longer afford to operate. He went on to say the oil workers in Mexico are already paid at a rate higher than that prevailing in any other industry there.

"Politicians, who have to a large extent gained control of the syndicates, are more concerned with the desire to eliminate foreign companies from Mexico through indirect confiscation than they are concerned with the desire to obtain fair conditions for labor. Agitation on their part never ceases, so that neither they nor the industry can enjoy peace," Farish's statement concluded.

A faint ray of hope, however, was seen in some quarters of Mexico City January 4 with a drastic re-organization of the cabinet by President Lazaro Cardenas in line with his new conciliatory attitude toward business. Silvestre Guerrero resigned as minister of the interior; General Rafael Sanchez Tapia resigned as secretary of national economy.

In connection with the cabinet changes Cardenas recalled that past policies had been directed largely toward improvement of farm conditions, but that the next three years would be concentrated on industrialization.

Eduardo Suarez, Mexican minister of finance traveling through Houston January 6, declared there is no desire on the part of the Mexican government to control the oil business or discourage foreign capital in Mexico. "The government desires only to control its resources. Foreign oil companies are needed in Mexico and are welcome there so long as they comply with the laws of the land," Suarez was quoted as saying.

Referring to current labor dispute, Suarez said, "Fair and just treatment for all parties concerned is the government's only interest in this dispute. The government intervenes only when it is invited."

Pine Refused Injunction

A federal district court last week ruled against the granting of an injunction sought by W. B. Pine to prevent the Oil Workers International Union from interfering with his drilling operations in the Seminole, Oklahoma, district.

Pine had brought the suit into federal court on the grounds his drilling operations were located on restricted Indian lands over which the federal government had jurisdiction. The decision of the federal court upheld a motion of the United States attorney general's office to dismiss Pine's petition for an injunction on this ground.

It was announced last week that a hearing on the labor case concerning Pure Oil Company will be held at Beaumont, Texas, on January 10 before the National Labor Relations Board.

Delay Pennsylvania Rulings

State supreme court rulings on Pennsylvania's 44-hour week law and the state's new liberalized workmen's compensation act were delayed last week, while the court admonished attorneys for both sides to eliminate all facts not relating directly to the question of whether the laws were valid. "This court is now loaded up with constitutionality cases," declared Chief Justice John W. Kephart. "It would seem that the 1937 legislature passed many unconstitutional acts."

The 44-hour week law fixes maximum hours of work as 8 daily, and 5½ days weekly. Two variations have been made by Ralph M. Bashore, secretary of labor and industry, and the State Industrial Board which will be of some benefit to operators of Pennsylvania's 95,000 stripper wells. One modification exempts employers of three or less persons, thereby giving relief to small operators, who under the special ruling

[*Continued on page 61*]

Hope Prevails Despite Uncertainties

Further gains in oil consumption expected, following the breaking of all previous records in past year . . . Large demand will necessitate continued heavy production and likely will sustain drilling.

By L. J. LOGAN, Associate Editor

DESPITE the current general business slump and the unsteadiness of the gasoline market, the executives of the oil companies in most cases are looking with hopefulness upon the prospects for 1938.

Such an attitude appears to be well justified, in the light of the record that was made by the industry in 1937 and in view of the fact that the industry still retains numerous advantages.

Encouraging Factors

Among the various promising factors in the oil industry situation, one of particular importance is the indication that petroleum demand will continue to increase in 1938 and again break all previous records. The total demand for oils in 1937 reached a new all time peak. But it now is indicated that demand in 1938 is likely to show a further increase of at least 5 percent.

Supporting this view is the fact that there are now about 30,000,000 motor vehicles in use, including automobiles, trucks and motor buses, or more than ever before; while the automotive industry is expecting to make and sell perhaps as many as 4,000,000 more vehicles in the coming year.

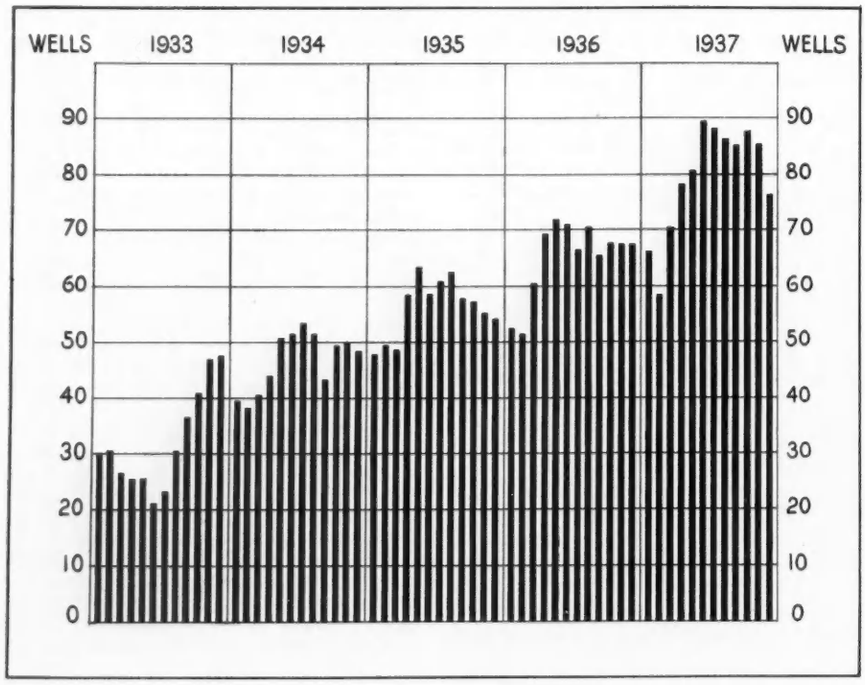
It probably is conservative, therefore, to estimate that gasoline demand in 1938 will be around 5 percent larger than in 1937.

Various other refined oils similarly have been in wider demand in recent years, and the consumption of those products may be expected to continue relatively heavy in 1938.

Fuel oil consumption, in particular, has been greatly expanding, in consequence of increased installations of oil burners in residences for heating purposes. And the demand for the burning oils undoubtedly will be heavy again in 1938.

The requirements for tractor fuel and kerosene also have continued to show increases, with the growing use of mechanical equipment in agricultural activities.

Average Number of Wells Completed Daily
(By Months, January, 1933-December, 1937)



Heavy Production Ahead

The large demand for petroleum that is in prospect for 1938 will necessitate correspondingly large crude oil production, refinery operations, and drilling, for keeping supply in line with the consumption.

United States crude oil production consequently may be expected to reach another all time peak in 1938, after having broken all previous records in 1937.

The output of crude oil by wells of the United States in 1937 aggregated 1,273,264,350 barrels, according to figures calculated by THE OIL WEEKLY from weekly reports of the American Petroleum Institute. That was 17.7 percent more production than in the previous year.

All of the producing states except Colorado participated in the expansion of crude production in 1937.

The greatest increase in output was that of 47 percent for New Mexico. But Wyoming had almost as great an increase, showing a 37 percent gain. In Michigan the production in 1937 was 33 percent greater than in 1936.

An increase of 35 percent was shown by the South Texas and Texas Gulf Coast districts, combined. In the other sections of the country, the increases in drilling were more in line with the national gain.

Drilling Prospects

Drilling in 1938 promises to be of similar proportions to that of 1937, according to preliminary information. This prospect is significant, since field work in 1937 was the greatest in the history of the industry, with the exception of 1920. In fact, if satisfactory crude oil prices can be maintained, it seems quite possible that there may be somewhat more drilling in 1938 than in 1937.

The total number of wells completed in 1937 in the United States was 29,014, according to data furnished to THE OIL WEEKLY by its staff men each week.

This total of well completions in

1937 was 21.3 percent greater than the comparable figure covering 1936. Most of the producing states and districts participated in this expansion of drilling. Exceptions included the East Texas field, where field work was down 6 percent; West Central Texas; and North Louisiana, where the decline was accounted for by the fact that the Rodessa field had reached the latter stages of development.

The greatest increases in drilling were those in West Texas and in Eastern Texas outside the East Texas field, where field work in 1937 was nearly twice as heavy as in 1936. Kansas also showed a noteworthy gain in field work, having had 54 percent more completions in 1937 than in 1936. Arkansas had a revival in drilling in consequence of the fact that the Rodessa field was extended into that state. In the other states and districts the increases in drilling were more in line with the gain for the nation as a whole.

December Results

December brought a continuation of fairly satisfactory conditions within the industry, with exception of continued excessive gasoline inventories. Crude oil production continued to be strictly controlled, and it was possible for the industry to withdraw approximately 1,500,000 barrels of crude from storage. That represented a continuation of declining stocks which began in September. In the final three months of 1937, approximately 8,000,000 barrels of crude came out of storage.

The oil industry's markets currently are unsettled, in view of lower gasoline prices. And in the next several months, exceptionally strict control of operations at wells and refineries will be needed, if greater stability and steadier prices are to be achieved.

Demand and Inventory Situation

(Figures, indicating barrels, are from Bureau of Mines.)

ITEM	FIRST 10 MONTHS 1936	FIRST 10 MONTHS 1937	FIRST 10 MONTHS Change This Year	OCTOBER 1936	OCTOBER 1937	OCTOBER Change This Year
Demand:						
All Oils	1,007,815,000	1,113,325,000	+10.5%	110,231,000	116,583,000	+5.8%
Gasoline, Domestic	402,279,000	436,637,000	+ 8.5%	44,253,000	45,361,000	+2.5%
Gas and Fuel Oil, Domestic	330,476,000	360,654,000	+ 9.1%	36,013,000	36,804,000	+2.2%
Stocks, End of Mo.:						
Crude Oil	.....	.....	.....	292,271,000	308,472,000	+5.5%
Refined Oils	.....	.....	.....	230,605,000	249,221,000	+8.0%
Natural Gasoline	.....	.....	.....	4,555,000	5,444,000	+19.5%
All Oils, Total	.....	.....	.....	527,431,000	563,137,000	+6.8%
All Oils, Days' Supply	.....	.....	.....	148	150	+1.4%

Changes in Stocks Since End of October

(Crude stocks figures from Bureau of Mines weekly reports; others from American Petroleum Institute weekly reports.)

DATE	Crude Oil (Barrels)	Gasoline (Barrels)	Gas and Fuel Oil (Barrels)
October 30, 1937	307,140,000	76,836,000	121,070,000
November 27, 1937	304,156,000	68,544,000	121,616,000
December 4, 1937	303,034,000	70,193,000	121,329,000
January 1, 1938	*303,041,000	77,291,000	118,660,000
January 2, 1937	†288,184,000	62,661,000	106,330,000
Change in past year	+5.2%	+23.3%	+11.6%

* Stocks December 18, 1937. † Stocks December 19, 1936.

Drilling and Production in December, 1937, and Cumulative for Years 1937 and 1936.

STATE OR DISTRICT	*DECEMBER, 1937, COMPLETIONS AND CRUDE OIL PRODUCTION: Total Wells	Oil	Gas	Dry	Initial Production	Production for Dec.	COMPLETIONS AND PRODUCTION IN 12 MONTHS, 1937 AND 1936: WELLS COMPLETED 1937: 12 Mo.	1936: 12 Mo.	Percent Change	DETAILS OF 1937 DRILLING: Oil	Gas	Dry	Initial Production	BARRELS PRODUCTION 1937: 12 Months	1936: 12 Months	Percent Change
Arkansas	18	14	....	4	11,803	1,415,950	140	90	+ 55	83	2	55	50,255	12,136,100	10,676,450	+13
California	95	79	....	16	50,885	21,918,600	1,470	1,123	+ 31	1,146	16	308	641,873	238,584,926	214,883,624	+11
Colorado	1	....	....	1	....	134,250	19	19	....	3	1	15	2,546	1,568,450	1,642,800	— 5
Eastern States	88	127	142	119	12,032	4,114,350	3,896	2,959	+ 29	1,305	1,555	1,036	103,270	45,181,700	40,019,850	+13
Illinois	68	34	....	34	9,086	.....	408	4	.....	258	5	145	78,262	.....	.....	.....
Indiana	24	7	10	7	50	.....	146	165	— 11	47	34	65	571	.....	.....	.....
Kentucky	68	29	21	18	1,662	.....	575	273	+110	282	119	174	9,153	.....	.....	.....
New York	5	....	4	1	.....	.....	26	.....	.....	1	15	10	26	.....	.....	.....
Ohio	114	36	39	39	1,019	.....	1,487	1,918	— 22	443	618	426	10,369	.....	.....	.....
Pennsylvania	27	6	14	7	66	.....	283	.....	.....	76	141	66	2,019	.....	.....	.....
West Virginia	82	15	54	13	149	.....	971	599	+ 62	198	623	150	2,870	.....	.....	.....
Kansas	168	109	13	46	108,025	5,453,400	2,657	1,722	+ 54	1,915	128	614	2,439,613	68,405,300	56,620,350	+21
Louisiana	78	43	8	27	23,588	7,635,450	987	994	— 0 7	622	105	260	307,889	91,316,250	80,585,150	+13
North Louisiana	47	25	8	14	15,175	2,342,450	510	556	— 9	326	91	93	156,429	28,619,000	26,706,850	+ 7
South Louisiana	31	18	....	13	8,413	5,293,000	477	438	+ 8	296	14	167	151,460	62,697,250	53,878,300	+16
Michigan	50	30	2	18	6,489	1,602,700	925	756	+ 22	605	63	257	249,294	16,189,100	12,096,200	+33
Montana	8	3	3	2	285	454,200	200	193	+ 4	145	25	30	12,189	6,036,200	5,701,100	+ 6
Nebraska	....	....	....	....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
New Mexico	39	35	2	2	19,653	3,327,550	674	564	+ 19	607	29	38	791,236	39,057,100	26,504,750	+47
Oklahoma	187	124	16	47	27,195	17,191,150	2,926	2,956	+ 2	2,066	140	720	1,945,214	224,000,300	200,639,400	+12
Southeastern States	....	....	....	....	.....	.....	17	12	+ 42	.....	.....	17	.....	.....	.....	.....
Alabama	....	....	....	....	.....	.....	2	2	.....	.....	.....	2	.....	.....	.....	.....
Florida	....	....	....	....	.....	.....	1	2	— 50	.....	.....	1	.....	.....	.....	.....
Mississippi	....	....	....	....	.....	.....	14	8	+ 75	.....	.....	14	.....	.....	.....	.....
Texas	1,092	851	38	203	1,321,690	41,808,950	14,997	12,527	+ 19	11,529	456	3,012	17,547,804	511,381,350	417,738,600	+22
East Texas Field	215	206	....	9	1,000,841	13,896,450	2,466	2,627	— 6	2,380	2	84	11,808,553	168,730,250	146,124,237	+15
Rest of East Texas	50	44	2	4	22,573	2,856,500	1,007	556	+ 81	860	37	110	531,759	41,652,750	35,845,913	+16
North Texas	138	74	2	62	19,919	2,259,550	2,254	2,179	+ 3	1,236	27	991	252,994	26,107,100	22,039,950	+14
South Texas	230	164	20	46	60,872	7,603,350	3,594	3,321	+ 8	2,533	143	918	1,014,479	86,730,300	36,078,100	+35
Texas Gulf Coast	115	94	....	21	48,156	6,008,450	1,537	1,127	+ 36	1,174	59	304	516,055	73,938,950	82,690,150	
Texas Panhandle	96	80	14	2	37,385	2,214,800	838	665	+ 26	655	153	30	322,681	27,801,100	22,475,550	+24
West Texas	219	182	....	37	130,579	5,949,300	2,898	1,579	+ 83	2,525	10	363	3,088,697	74,275,000	62,492,800	+19
West Central Texas	29	7	....	22	1,365	1,020,550	403	463	— 13	166	25	212	12,586	12,145,900	9,991,900	+22
Utah	1	....	1	....	.....	.....	1	.....	+100	.....	1	.....	.....	.....	.....	.....
Wyoming	10	7	....	3	1,784	1,539,350	105	102	+ 3	65	10	30	46,168	19,486,350	14,238,100	+37
Total United States	2,135	1,422	225	488	1,583,429	106,595,900	29,014	23,918	+ 21.3	20,091	2,531	6,392	24,137,351	1,273,264,350	1,081,346,374	+17.7

* December completions cover not the calendar month, but the four weeks, or 28 days, ended December 25.
Fields of Corpus Christi district, now included with South Texas, were shown in Texas Gulf Coast in 1936.

GEOLOGY AND PETROLEUM DEVELOPMENT OF THE

Western Kentucky Basin

By GEO. R. WESLEY, Geologist
Owensboro, Kentucky

THIS article deals very briefly and from a very generalized point of view with the geology and petroleum development of that part of the Eastern Interior Basin within the State of Kentucky. The Eastern Interior Basin lies between the Cincinnati Arch on the east, the Ozark region on the west, and the Wisconsin uplands on the north. Parts of Indiana, Illinois, and Kentucky are included in this structural basin.

Locally, the area to be discussed is referred to as "The Western Kentucky Coal Basin." In the same way the term "Illinois Basin" has come to be used for that part of the basin which lies within the State of Illinois. The geological significance of Kentucky's portion of this basin is not materially different from that in Illinois and Indiana. Its potentialities for petroleum and natural gas production, likewise, are not radically different.

RECENT discoveries of oil by major oil companies in the Illinois portion of the Eastern Interior Basin has given impetus to an extensive leasing program which spread first to Indiana and then to Kentucky. Representatives of a number of major oil companies, smaller companies, and independent operators are busy in Kentucky at present. Geological and geophysical exploration by the various individuals interested is now in progress. Some of the companies represented are: The Carter Oil Company, The Texas Company, Sun Oil Company, Magnolia Petroleum Company, Tide Water Associated Oil Company, The Pure Oil Company, Phillips Petroleum Company, Ohio Oil Company, South Penn Oil Company, and several smaller companies and independents. Owensboro is the center from which most of this work is carried out.

History of Area

Western Kentucky has been a producer of oil and gas since the early 1860's. The earliest record of a producing well in the state of Kentucky was in 1819. This well was located in what is now McCreary County in southeastern Kentucky. In 1829, the next well was drilled in Cumberland County in south-central Kentucky. This latter well produced from porous limestone of Ordovician age and was located near the axis of the Cincinnati Arch in the "Saddle" between the Lexington and Nashville domes. It was known as "The Great American Well" and was reported to have produced about 50,000 barrels of oil from 1829 to 1860. Production from Devonian limestone in Allen, Warren, Barren and Monroe counties was discovered in the early 1860's. This pay horizon is known throughout Kentucky as the "Corniferous Lime." It has been the most prolific producer of oil of any horizon in Kentucky. The Basin proper did not become a producing area until early in the present century. The "Old Hartford Pool," near Hartford, Ohio County, was discovered in 1912 or 1913. Production in this pool was from the "Corniferous" and the oil runs from one lease on which two wells were on production was over 42,300 barrels. This pool was located on the south side of the Rough Creek Anticline.

After the World War, random drilling of wells in the eastern margin of the basin started development of the shallow Pennsylvanian and Chester sandstone pay horizons. Hundreds of wells have been drilled in Daviess, Hancock, Ohio and adjacent counties, which vary in depth from 150 to seldom over 1,000 feet. Initial production from these wells ranges from 1 or 2 barrels to 800 or 900 barrels per well per day. The average is less than 100 barrels per well per day. Early decline is rapid for these wells but their life on production is reasonably long. Antiquated operating

practices are partly at fault in such a rapid decline.

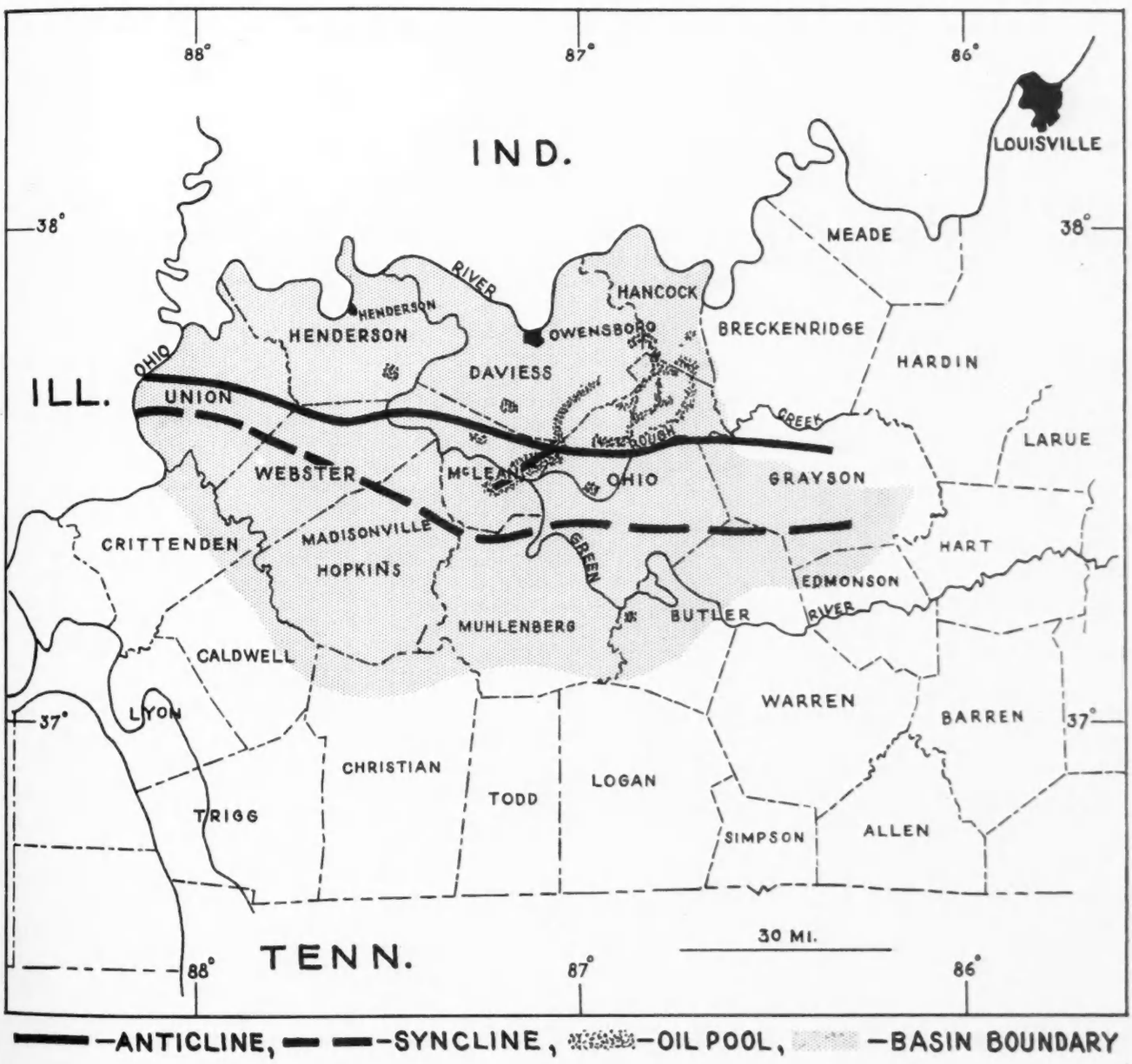
In the past, most operations have been carried on by small, independent operators. Wasteful production methods, therefore, were naturally developed. Lack of the proper controlling statutes in Kentucky has permitted unnecessary waste of gaseous reservoir energy until recently. Therefore, in many instances, dissipation of gaseous reservoir energy forced secondary recovery methods or abandonment. Within the last three years repressuring these old properties with air or gas has been profitable. In addition, the advent of repressuring practices has served as an educational medium in production methods. A large share of the credit for promoting repressuring and thereby improving production methods in Kentucky is due D. J. Jones, state geologist. His efforts have been invaluable to the oil and gas industry in Kentucky, though handicapped by a low appropriation with which to work.

Geology

The topographic expression of the land in the Western Kentucky Basin may briefly be described as valley flats and rolling uplands. In localities where a more resistant bed outcrops the topography is usually more rugged than is normally expected elsewhere. The larger streams which drain this area are the Ohio Green, and Tradewater rivers. Usually the present channels of these streams flow on an alluvial fill which reaches a maximum thickness of over one hundred feet. These streams do not always follow their old channels which were cut down in bed rock previous to ponding of drainage in the region. The smaller tributaries which head in the hills are rapidly filling their lower valleys, due to the careless removal by man of the natural

Sketch Map of Western Kentucky Basin

By GEO. R. WESLEY — 1937



—ANTICLINE, — —SYNCLINE, —OIL POOL, —BASIN BOUNDARY

covering at their sources. Most gradients of streams in this area are low. The terrain is easily traversed by highway or railroad. In addition to a network of improved roads, most of the country roads may be traveled most of the year, some becoming impassable during the winter season.

Little is known of the deeper beds which may underlie this area. It is generally supposed, however, that upon the Basement Complex, sediments of Ordovician or older age rest unconformably. No drill holes or shafts have penetrated to this depth, hence, the thickness of this section of rocks and much of its nature is unknown. It is thought that these lower beds are chiefly limestones, with sandstone and shale members. It is likely that a thick section of Ordovician rocks is present and possible that such horizons as the "Wilcox" which are capable of serving as reservoir rock for petroliferous concentration are present.

Overlying the Ordovician sediments are from 100 to 1150 feet of Silurian and Devonian limestones, sandstones and shales. Limestones and dolomitic limestones constitute the bulk of these sediments. The upper part of this section is known as the "Corniferous" pay in Kentucky. Elsewhere in the state, where it has been explored by the drill, it has been the most prolific producer of oil of any "sand" in Kentucky. It must be remembered that during Silurian and Devonian time the Cincinnati Arch was a positive element and that Devonian and Silurian sediments thicken down the slopes on either side of it. Hence, it would not be entirely out of line to predict the likelihood of the appearance of some of the beds in the Eastern Interior Basin which are encountered in the Appalachian province. It is well known that along the crest of the Arch in the saddle between the Lexington and Nashville Domes that Silurian and Devonian beds are often absent and that they appear on the flanks and thicken by progressive overlaps into both eastern and western basins. Therefore, it is possible that such beds as Oriskany and Clinton or their equivalents be encountered in the Eastern Interior Basin. The carbon ratio throughout the Eastern Interior Basin is low enough to permit petroleum and natural gas concentration in such lower beds which might be present. The Chattanooga black shale, which is probably of Devonian age, overlies these sediments. It varies in thickness from less than 100 to over 250 feet, in areas where it has been drilled.

Rocks Exposed in Kentucky

Era	System	Series
Recent	Aluvium	
Cenozoic	Pleistocene	
	Quarternary	
	Tertiary	
Mesozoic	Upper Cretaceous	
Paleozoic	Pennsylvanian 2,800'	Monongahela
		Conemaugh
		Pottsville
	Mississippian 2,300'	Chester
		Meramec
		Osage
	Devonian	Chattanooga
		Hamilton
		Onondaga
	Silurian	Lockport
		Clinton
		Brassfield
	Ordovician	Richmond
		Maysville
		Eden
		Lexington
		High Bridge

Unconformably overlying the black shale is the Mississippian system of rocks which aggregates a thickness of approximately 2,300 feet of limestones, shales and sandstones. Mississippian strata are divided into Osage, Meramec, and Chester rocks in ascending order. Basal Osage rocks are usually shales which become more calcareous and are interbedded with thin limestones higher in the section, finally grading into limestones at the top. The unconformity which separates the overlying Meramec rocks from the Osage is not very great. The Meramec consists almost entirely of limestones. It is oolitic near the top in the St. Genevieve formation. This oolitic zone is the "McClosky" producing horizon of Illinois, Indiana, and Kentucky. The unconformity which exists at the base of the St. Genevieve is not apparent in western Kentucky.

The Eastern Interior Basin was warped slowly downward during Chester time, intermittently. Hence the Chester series of rocks consists of alternating limestones, shales and sandstones. Where these sandstones are exposed for study and where they have been penetrated by the drill in the eastern part of the basin, they display the characteristics of shoreline sedimentation, in which "Shoestring" sands which are lenticular and variable in characteristics are present. Rhythmic advances and recessions of the shoreline during Chester time are evident. The nature of the equivalent beds further into the basin is not definitely known. Outcrops on the western flank of the basin suggest that these sandstones may possibly be less erratic westward than they are on the eastern margin of the basin.

Following the period of erosion and folding at the close of Mississippian time there was widespread inundation of the area and deposition of Pennsylvanian beds began. Sedimentation was rather rapid at this time. During Pennsylvanian time, shales, sandstone, clays, coals and thin limestones were laid down, which aggregate a total thickness of over 2800 feet. Strata of Pottsville, Allegheny, Conemough, and possibly of Monongahela age are present. The Pottsville consists dominantly of sandstones, some of which are conglomeratic in places, with shales and a few thin coals and thin limestones. These coals become workable locally but not extensively. The Allegheney contains a dominance of shales with sandstones, clays, workable and non-workable coal seams and thin limestones. Number nine coal of Kentucky (number five of Illinois) is the most persistant and most widely worked bed in the Eastern Interior Basin. It ranges from four to six feet in thickness in Kentucky. Conemaugh beds are dominantly shales, but do contain sandstones, a few thin limestones and a few coal beds which are workable locally. If Monongahela beds are present they are composed of barren shales and sandstones. Deposition here was in a basin which was being warped slowly downward more rapidly at times than at others. Gentle arching of the Rough Creek anticline was in evidence during this time.

A large part of the structural history of the Western Kentucky basin is not available for study in surface rock exposures. Much of it must be inferred from regions outside the state boundaries. Deformation previous to Mississippian time no doubt occurred, though little data on the basin itself is available. The Cincinnati Arch was in existence as early as Ordovician time, as evidenced by the thinning of

sediments which overlap on it. A distinct westerly trending limb extends from the Arch in central Kentucky which becomes more pronounced to the west. This line of disturbance becomes the Rough Creek Anticline in western Kentucky. It is possible that this anticline was in existence as early as Silurian time, and certain that it was present in Mississippian time, as a low and elongate east-west fold. At the close of Mississippian time there was a period of more intense deformation which was accompanied by folding and possibly some faulting. The Pennsylvanian overlap of Mississippian rocks in Kentucky extends through the entire Chester series and part of the Meremac Group of rocks. Several minor unconformities exist within the Mississippian system of rocks, but none of these are comparable to the great unconformity at the base of the Pennsylvanian. This Pennsylvanian overlap is even more pronounced northward into northern Illinois.

The Illinois portion of the Eastern Interior Basin has been discussed in various trade journals and in scientific publications during the past year at considerable length. It is therefore taken for granted that the reader has at least a general knowledge of its geological features. From the bottom of the Basin in Eastern Illinois, there is a progressive rise in structure southward and southeastward through Indiana into Kentucky. This rise is not uniform but is interrupted by an east-west fold which is known as the Rough Creek Anticline. This elongate, asymmetrical anticline extends from the Ohio River at Shawneetown, Illinois, eastwardly across the Basin to the Cincinnati Arch. Thus the western Kentucky portion of the Basin is divided into two distinct parts.

The Rough Creek Anticline is distinctly a compressional fold and is usually faulted as a single high-angle overthrust from the south or into a complex pattern of block faults, accompanied by thrusting. Locally, the axis of this anticline turns rather sharply and at such localities complex faulting is almost always found. Displacements of the Rough Creek fault vary from a few feet to greater than 1,000 feet. The intensity of the deformation diminishes eastward.

South of the Rough Creek Anticline and Fault Zone and paralleling it lies a sharply folded, asymmetrical basin. The bottom of this basin is thought to be about 2,800 or 2,900 feet lower structurally than the crest of the anticline north of it. The north limb of this basin dips sharply to the south at a fairly high angle, dips of as great as 35 degrees having been observed by the writer. The south limb dips more gently to the north, though some steep dips have been observed there. The southern margin of this synclinal basin is broken into a complex pattern of block faults which radiate from the complexly faulted and folded area known as the Flourspar District on the southwestern side of the Kentucky basin. Thus, there is an elongate east-west anticline which is paralleled by an elongate syncline which in turn is flanked on the south by sharp folds and faults giving a regional impression of deforming forces having acted in a north-south direction as compressional stresses.

Accompanying such deformation a certain amount of metamorphism is inevitable. However, the degree of metamorphism is not sufficient to prohibit petroleum concentration except in a few localities. Semi-quartzitic sandstones have been observed by the writer in the immediate proximity of one of the faults of the Rough Creek system near Livermore in McLean County and oil and gas in commercial quantities were found less than 500 feet from the fault plane.

The greatest period of rock deformation which is apparent in this region was during the Appalachian Revolution when compressive forces from the south warped and faulted the southern part of the Eastern Interior Basin into the sharply folded structures which are now present. Deformation of deeper beds is more intense and deeper seated structures are sharper and cover less area than do the structures which are apparent from surface exposures. Thinning of beds of Mississippian and Pennsylvanian age on older structures has become evident from subsurface studies in several instances. The deepest well that has been drilled in the Kentucky Basin did not penetrate strata which are not exposed for study at some locality in the state. The driller's log of this well is as good as the average log in this area, but it does not contain the information necessary for concise analysis. Samples for this well are not available for study.

Economic Outlook

The economic outlook for the Kentucky portion of the Eastern Interior Basin is not dark at the present time. In the first place, only a small part has been tested by drilling. Secondly, there has not been adequate testing of beds below the Middle Chester Group. Thirdly, there is no proration of production in this area.

In the past, operation has been confined to the activities of the smaller companies or independent operators, with a few exceptions. However, the majority of operations have been by people who either did not have much money with which to operate, or were unwilling to spend money to test any part of the basin other than the shallow areas. Not all the shallow areas have been tested by any means, and practically none of the deeper part of the basin.

Random drilling has been the custom in the past, and still is the leading method of oil-finding here. Scientifically directed drilling has gained very little headway, as the natural outcome of the type of operators involved. However, the value of such direction in exploration is being taken cognizance of by the more progressive small companies. With the advent of major companies with their geological and geophysical staffs, which are well organized and well directed, the more modern methods of exploration are being looked upon with more favor locally. Discoveries in Illinois which were the direct results of scientifically directed drilling have been a most convincing argument in its favor.

In the past, few major companies have been interested in production from shallow Pennsylvanian and Chester beds. Some of them have attempted to operate but left the field after having given it what they probably considered a fair trial. These failures may be largely attributed to the existing set of geological phenomena. The sandstones along the eastern flank of the basin, where almost all the exploratory drilling has been carried out, are lenticular in nature. They are the products of buried stream channels and bars of migrating shorelines. Hence, structure plays a secondary role in oil and gas accumulation there.

The deeper portions of the basin have not been explored by the drill. Until recently the surface geology has not been extensively studied, reports of the State Survey having been largely generalized. Geological and geophysical activity which is now in progress by several companies will, no doubt, reveal much information on the structural and stratigraphic geological phenomena of the Kentucky portion of the Eastern Interior Basin.

OBTAINING MAXIMUM PRODUCTION THROUGH

Efficient Operation of Sub-surface Pumping Equipment

PART I

Subterranean Hazards

By DON E. SCHNOBRICH

PIONEERED and developed in the past several months by conscientious operators in various fields throughout the country, a number of new methods and procedures have been instigated and advanced concerning the efficient and trouble free operation of sub-surface pumping equipment under normal or extremely adverse subterranean conditions.

It is the intention in this series of three articles, to present these methods individually rather than collectively — and in direct conjunction with the particular problem they concern. The manner in which the hazard or difficulty hampered production will be stated, the steps and methods taken to remedy the situation discussed and, finally, the obtained results whether successful or partially so, will be disclosed.

WHEN an operator, in striving to obtain the maximum production that any particular well or lease has to offer, finds himself confronted with such subterranean hazards as acid, corrosion, gyp, abrasion, sand, paraffin, or similar troublesome conditions, usually he also finds that many of his problems center about the efficient and successful operation of the sub-surface pumping and fluid lifting equipment. Frequently, as in extreme sulphide or corrosive conditions, the situation becomes so alarming as to apparently justify abandonment.

Recently, however, rapid strides have been made in successfully combating these subterranean conditions and it might be said that most of the major difficulties have been satisfactorily brought under control.

Sulphide and Corrosive Conditions

From a maintenance and operation expense standpoint, the presence of sulphide or corrosion has often been considered as the most serious of all subterranean hazards. Wholesale destruction of tubing, rods, working barrel, nipples, anchors — in fact all sub-surface equipment is subjected to complete or partial disintegration necessitating frequent pulling jobs, replacements, and costly repairs.

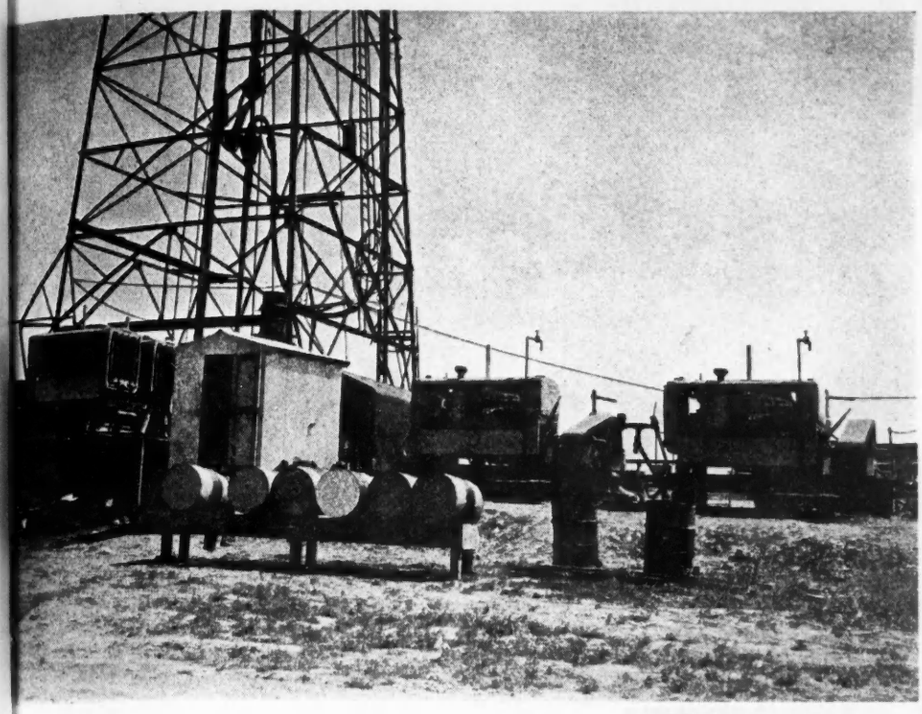
The presence of hydrogen sulphide, commonly associated with lime and seldom if ever from sand, undoubtedly has contributed more to rod and working barrel troubles than any other similar corrosive substances. Although controlled successfully when little or no water is made with the oil, it becomes a most destructive agent when water in any considerable volume is produced.

Sucker rods of the most expensive and durable steel obtainable, have been known to become so embrittled in these conditions as to shatter at the blow of a hammer or to break into pieces when laid on the derrick floor. Forty rod breaks per month per well have been fairly common in many sulphide fields.

Fortunately, the sucker rods and tubing situation has been remedied to a large extent by the use of equipment especially treated to withstand corrosive conditions, and is offered at present by several major manufacturers and suppliers. Many operators have reported a rejuvenation of their rod and tubing strings showing indications of corrosive fatigue by a low annealing or heating over a wood fire. Exposure to air or sunlight for periods of time also has been known to release the hydrogen from the rods and return them to their original durability and toughness.

In working barrel and accom-

A TOUGH TEAM TO BEAT



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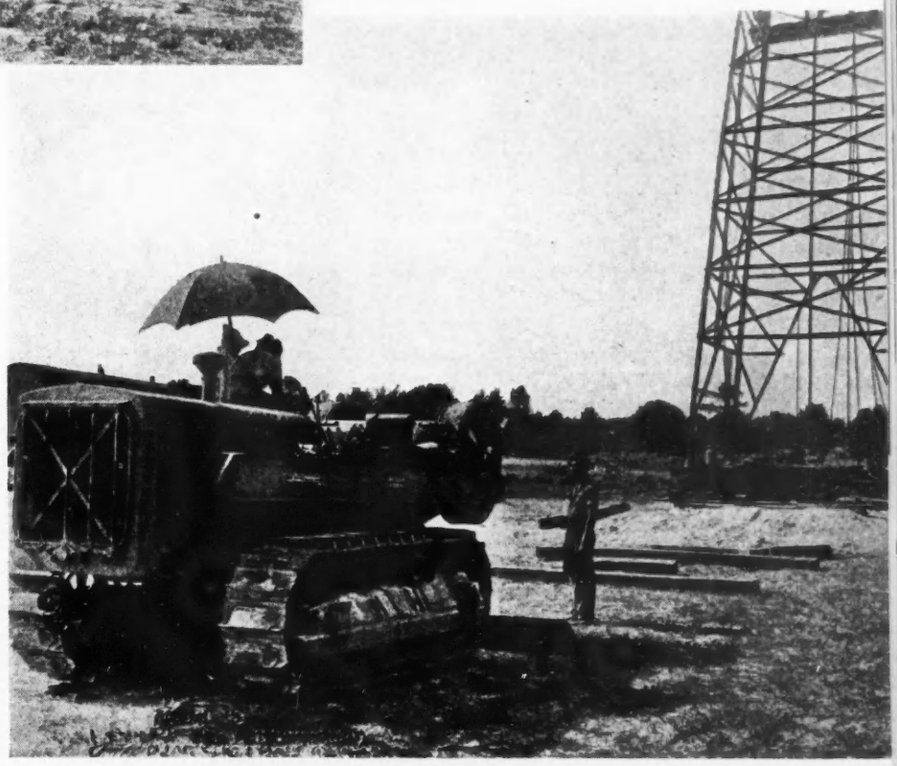

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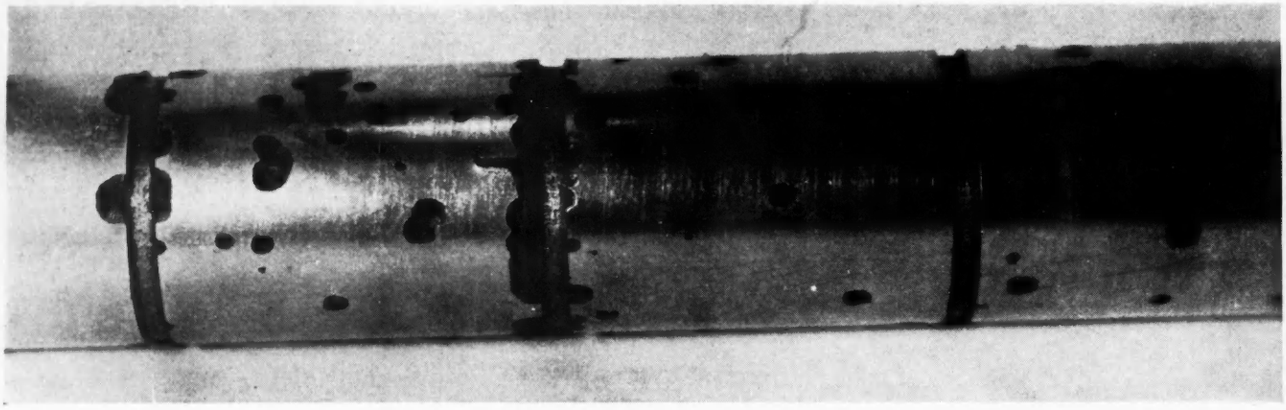

FIGURE 1

Effects of extreme corrosion on a good chrome plunger. Large portions of the chrome plating have been eaten away, exposing the raw steel beneath.

panying equipment, however, the situation is much more difficult to control and often its failures are much more disastrous. The large number of fittings, valves, threads and parts to contend with, render the situation correspondingly difficult to handle. Strangely enough, little trouble is experienced in the disintegration of the cast or alloy liners of the working barrel proper. After a certain amount of corrosive wear takes place, the liners apparently develop a form of immunity and little effect is noticed thereafter. In steel, however, the situation is much more serious. Collars, valves, jackets, and all threaded parts, when of steel, are particularly susceptible. Ordinary steel plungers are worse than useless, although special alloys of this metal have been reported to withstand the corrosive effects to a greater advantage.

Chromium plated plungers, long known for their special corrosion resisting properties, have undoubtedly contributed more toward relieving the situation than any other medium. They are not infallible in extreme cases, however, and frequently results similar to those in Figure 1 occur.

In this instance, and which may be taken as a fairly ordinary example, large portions of the chrome plating have been softened and eaten away exposing the raw steel beneath. The acid, afforded the opportunity to work on the susceptible steel, left numerous pits and pock marks which consequently destroyed the sealing efficiency to a large extent. "Grooved" plungers, as will be discussed later, seemed even more liable to the corrosive effects than the plain.

Undoubtedly, however, the most serious part of the entire situation was in the destruction of valves and fittings. Figure 2 shows a typical example and in this case eventually resulted in a complete replacement of the working barrel at a cost of approximately $150—together with the tubing round trips and production loss.

The fitting shown, a bottom plunger valve of a tubing-type pump, was run by The Texas Company in its Three Sands field (Tonkawa) of Northern Oklahoma for a period of about six weeks. At this time, the corrosive fluid had succeeded in sufficiently eating through the threads of the seat lock nut as to cause it to loosen and drop to the lower pump collar where it wedged. Naturally, the ball and seat also dropped out at this time. The plunger, stroking on as before, encountered this obstacle at the bottom of each stroke and in short order so hammered and swelled its lower valve that, in stroking back through the liners, it caused many of these to split and crack and so scarred the others as to leave them unfit for further use. Eventually, the damaged plunger itself jammed and a stripping job was necessary for its removal.

By no means is this a rare or unusual occurrence or confined to this particular fitting. Many field men operating under similar conditions will recognize this as a very ordinary happening and, frequently, much more serious. The situation in this, and in similar cases, was aided considerably through the use of the "Sewerball" Pack or Anti-Corrosion Ring.

It was common knowledge that the destructive action of the acid became intensified when allowed to set up a turbulence in any recess or orifice—in the case of the bottom plunger valve mentioned before, this recess was between the seat lock nut and blind cage—the terrific velocity of the swirling corrosive fluid forcing its way through the threads securing the fitting. It was reasoned that in order to cope with the situation it was necessary to seal all recesses and openings against the fluid entrance and the ring pack adequately handled the problem.

It was noted that not only did the pack prevent the entrance of the corrosive fluid to any particular joints or threads, but that it also provided a smooth, resistantless surface for the wash of the fluid to work against.*

In instances in which production is of sufficient volume and value to justify the expenditure, stainless steel fittings are employed. From a standpoint of their acid and corrosive-resisting properties, the stainless steel was found to withstand the ravaging corrosive effects perfectly. In few cases were any sort of destructive indications observed and the fittings were able to be used repeatedly with no other ill effects than natural wear. As stated before, however, fittings of this type are figuratively speaking "Worth their weight in gold," and their cost usually prohibits their use. Chrome plated fittings have also been used to some extent with

(*To the best of the author's knowledge, the anti-corrosion ring just discussed is not manufactured by any concern at the present time. It was developed to deal with corrosive conditions and is usually made up by the field man on the job.

It consists, briefly, of a section of copper or brass tubing filled with lead or solder and fitted into the openings between parts before they have been made up. Following this, the ring is hammered into place and the fittings gradually made up. When completed, and all joints tight, the pack is dressed off smooth so as not to protrude over the surface of the fitting proper. Figure 3 shows the ring or pack in place and, in this instance, seals the gap [shown by arrow] left between valve blind cage and seat lock nut.)

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varying results. In some cases the chrome was able to withstand the corrosive effects, but in extreme conditions did not prove practical.

Sand

Not the least of the subterranean hazards demanding individual methods of handling are extreme sand and abrasive conditions which often become so acute as to seemingly defy any attempts at correction.

At present, it is the general opinion among field men operating under this handicap that there are only four efficient methods of handling this condition successfully and they are namely; skimming, agitation, virgin-fit plungers, and location of the working barrel. Usually it is found that one or a combination of these can be applied to any sand condition known today.

Although the process of skimming has long been known to operators as a possible method of obtaining production under a sand hazard, it has not been until lately that the process has been worked out in fine detail and the operating technique correspondingly improved upon.

Briefly, the method of skimming consists of allowing the sand to settle to the bottom and, in pumping the well at intervals, obtaining the comparatively free fluid on top. The pumping equipment is swung from the well head with the working barrel located at a certain depth in the fluid column.

In conditions in which the oil sand granules are of 0.0117-inch opening or larger, this process has been found fairly acceptable. The major difficulty encountered here, however, was in determining the proper pumping intervals, time lengths, and location of the working barrel in order to obtain the greatest possible amount of free fluid without overpumping the well and thereby washing yet more sand from the formation.

A simple but effective process was introduced to determine the settling rate of the sand per foot and apply it to the height of the fluid in the hole. It was reasoned here, that once the time necessary for the sand to settle to the bottom of the fluid column was obtained, the proper time lapse between the pumping intervals could be determined, as could also the correct time limit for actual pumping. The following method for obtaining the settling rate of the particular sand under question was employed and found to give good results:—

A sample of the oil sand is obtained, usually that which has accumulated in the working barrel, and is subjected to a thorough cleaning process to remove all oil, dirt, or similar foreign substances. Ether, carbon, tetrachloride or alcohol may be employed as solvents for this purpose;

The sample cleaned and dried, a glass vessel of known height is next obtained and filled with water or an oil of known density. The clean sample is then lightly sprinkled upon the surface and the time necessary for it to settle to the bottom noted and compared to the height of the vessel. Thus the settling rate per foot is obtained. If water is used, it is to be remembered that oil is of a relatively higher gravity and in it sand will settle faster. The settling rate per foot obtained, it is then applied to the height of the column of fluid in the well and the time necessary for the sand to settle that distance computed. Pumping periods and time lengths are proportionately adjusted.

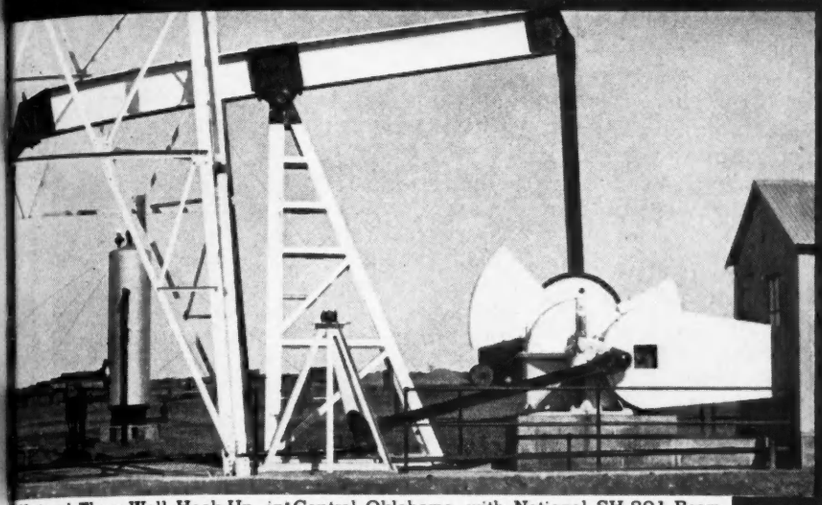
Through this process, the depth of the working barrel is determined also and, with the well pumping

FIGURE 2

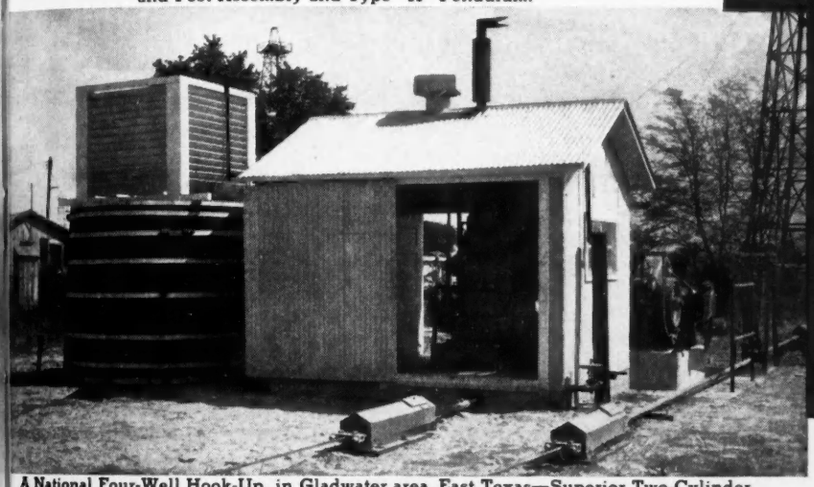
Destruction of bottom plunger valve due to a corrosive condition. Ball and fragments of seat and lock nut were recovered after tubing was pulled. Note the swelled and battered portion of the cage.

NATIONAL

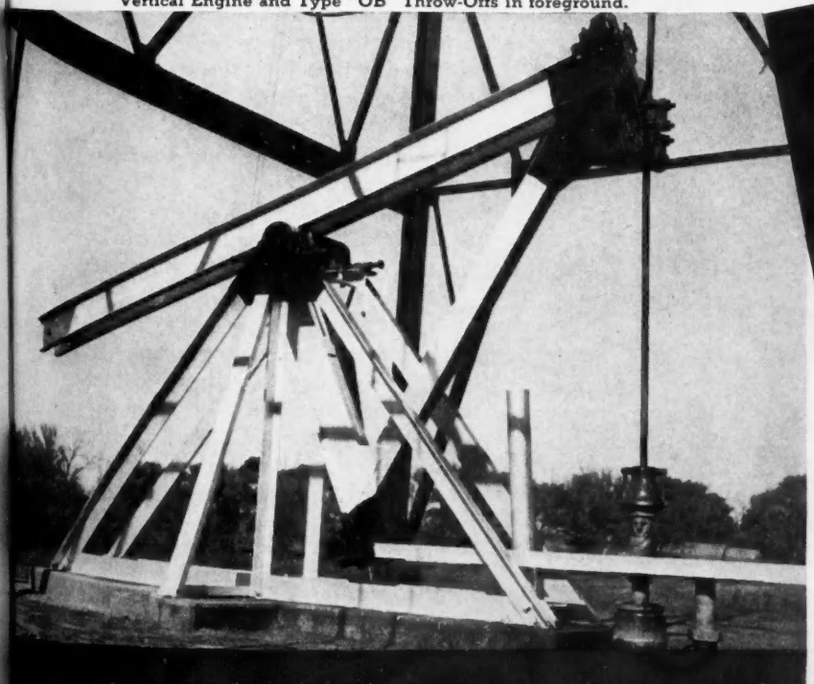
TWO, THREE AND FOUR WELL HOOK-UPS



National Three-Well Hook-Up, in Central Oklahoma, with National SH-801 Beam and Post Assembly and Type "H" Pendulum.



A National Four-Well Hook-Up, in Gladwater area, East Texas—Superior Two-Cylinder Vertical Engine and Type "OB" Throw-Offs in foreground.



AN ECONOMICAL MEANS OF PUMPING

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A National D-130 Underpull Jack used with National Three-Well Hook-Up on a 4500 foot well in Oklahoma.

at properly timed intervals and lengths, it has been found that the majority of the free fluid can be successfully lifted without sanding-up the equipment or disturbing the formation.

This process, although successful in the majority of cases where the fluid level is high enough to employ it, is not satisfactory, however, in wells in which the fluid level is low. Here radically different tacties are used.

It has been found that in wells of a low fluid level, or in those handicapped with the so-called "floating" sand, that the agitation method produces the better results. This method is, roughly, simply to operate the well fast enough and with a certain stroke — so as to keep the fluid under constant agitation in order to continuously move the sand.

The agitation method, however, has a number of related drawbacks. In the first place, the subsurface equipment can never be allowed to remain stationary in the hole for any length of time. If, for any reason, it is necessary to bring the well down—it is also necessary to remove the working barrel and rods. It is usually found that when a well is brought down, and the pumping equipment allowed to remain inactive for any length of time, an inevitable sanding-up occurs.

In employing the agitation method in moving sand it is necessary to choose rods of the most durable type obtainable. Not only does the excessive strain of the faster strokes and repeated reversals have to be considered, but also the seriousness of rod breaks and failures under these conditions. Usually, while the break is being repaired or a loose string recovered, the sand of the fluid column is allowed to settle around the working barrel—with a wet stripping job as a possible result.

In most companies, where the lifting cost is computed per barrel, it is found that over any period of time, the previously discussed skimming method obtains the fluid for less cost. Often, however, when the fluid level is low, there is no choice in the matter and it is necessary to employ agitation or similar processes.

It is common knowledge that the position of the working barrel in the fluid column is an important factor in combating sand conditions and in production volume. Especially was this true in the skimming methods, but it was noted also that when constant sanding-up of the working barrel occurred, the situation could be relieved somewhat by swinging the pump barrel to a relatively higher position in the fluid column.

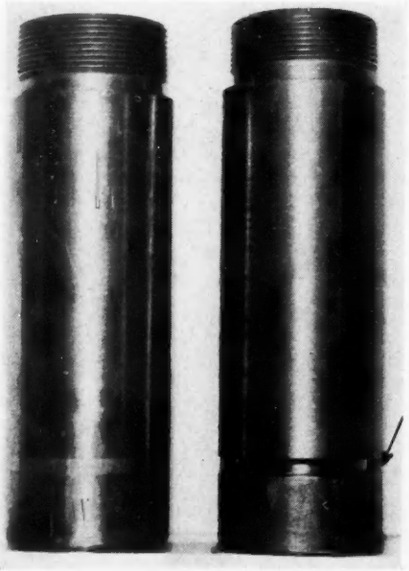
In the use of the "virgin-fit" plungers or a smaller working barrel with a smaller tubing as a possible means of combating a sand condition, the theory here revolves about the point to obtain the greatest possible up-current velocity in order to conveniently carry the sand up out of the well and into the tanks.

It is reasoned that in the use of the virgin or close-fit plungers, that the less clearance between plungers and liners, the less space for sand accumulation and the less opportunity for slippage. Also, if leakage past the plunger is minimized, it is reasonable to expect an increase in fluid with a consequent increase in up-current velocity. In sand conditions of 50 mesh or finer, it has been found that this material will be held in suspension in comparatively low velocity currents. Larger granules, however, demand sufficient velocity to prevent them from settling.

The use of the smaller barrel with the smaller tubing has been found to substantially increase up-current velocity due, of course, to the smaller diameters. Once the additional velocity is obtained by either virgin-fit plungers, a smaller working barrel, or both—sand of many conditions can be efficiently moved.

FIGURE 3

Showing the anti-corrosion ring as used in sealing the gap (arrow) between seat lock nut and blind cage of plunger valve.



Sand production pumps are another means of overcoming sand conditions. The success of these depends to a large extent upon the type of the conditions encountered. About the only known means an operator has of judging if a sand pump will help in his particular condition or not is to try it and find out.

In Deep Well Insert Pumps, however, it is a known fact that the Traveling Barrel or "inverted" types are much more adaptable to sand conditions than are their running mates the "Regular" Insert or Rod-Type pumps. The reason for this, undoubtedly, lies in their construction features—the Inverted having fewer spaces and openings for sand entrance and accumulation. Then, too, the Inverted requires no Outer Jacket and consequently eliminates the danger of sanding that particular piece of equipment.

Abrasive Conditions

Closely allied to sand conditions, the problem of abrasion is probably the mildest of all natural hazards and usually confines itself to promoting an abnormal wear of moving parts.

Sand of a very fine mesh, shale, or similar substance, grinding between the face of the moving plunger and stationary liners or vice versa, acts as a powerful emery and has been known to produce the equivalent to legitimate wear in an amazingly short time. Five to fifteen thousandths have been reported in thirty days. Considering this, and when it is realized that the majority of metal-to-metal seal pumps depend upon a two to five thousandths fit for a fluid seal, the decrease in efficiency can easily be noted. Moreover, in wells producing a high gravity crude, wear of this sort is of critical importance.

Fortunately, however, the abrasive situation in most cases is relieved beyond all reason for anxiety through the use of the so-called "hard" liner (Brinell 350 or more) and the chrome plunger. Little trouble is experienced when this combination of equipment is employed.

[To be continued]

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Establishing High Pumping Potentials

IN WESTERN KANSAS PLACE MAXIMUM SERVICE DEMAND ON LIFTING UNITS

By FRANK B. TAYLOR,
Staff Writer

IN Western Kansas, where the majority of wells are dependent upon pumping equipment for lifting the oil to the surface, operators are making extraordinary demand upon such units in an effort to establish high potentials. Although only a small quantity of power is required for normal pumping operators, extra heavy installations operating under high horsepower drive are installed in order to build up well potentials. Polish rod loads of 30,000 pounds have been proven, and calculated on the basis of four hours continuous operation, rated potentials of 3000 barrels daily have been established.

The type of equipment being used for this purpose is of interest, as it shows what lifting units can bring to the surface. But, first it is necessary to understand the widespread activity covered by such practices in order to realize its importance.

Covers Active Area

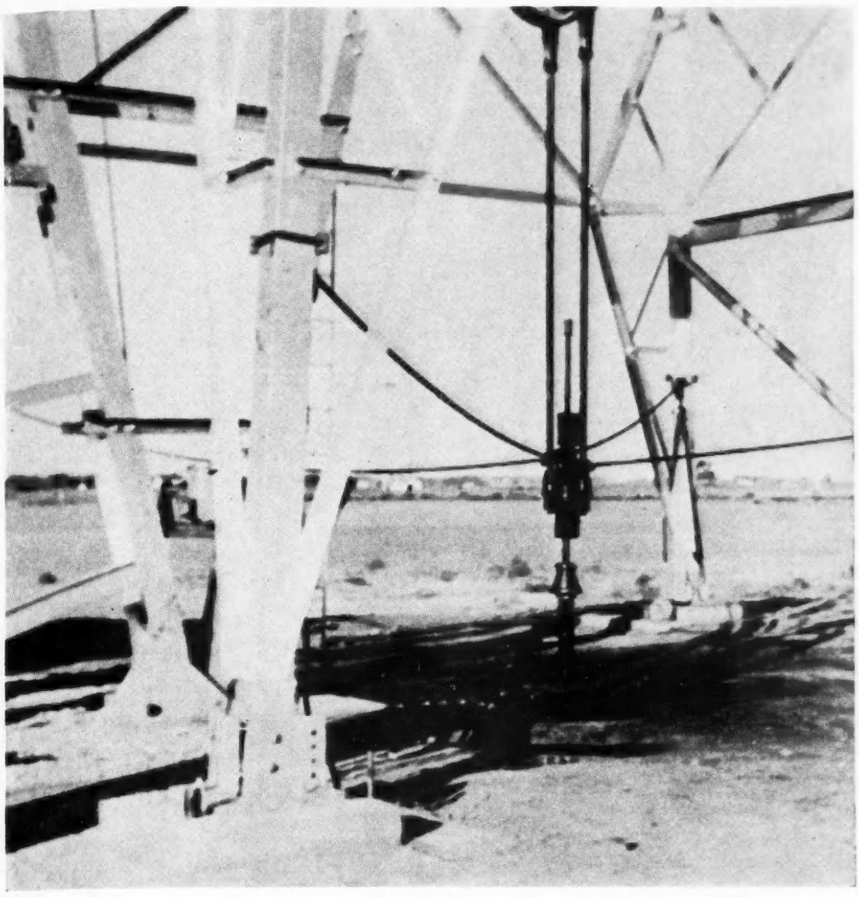
The entire western section of Kansas, from zero range to the western limits of production, embraces the most active development in the state at present. Within this area there are about 180 individual pools producing under proration. This is by far the majority of prorated fields in the state, and by far the greater number of the wells are on pump, most of them going to pumping equipment as soon as completed. Few wells flow naturally as reservoir energies are relatively low, except in Chat production area.

All wells capable of producing in excess of 15 barrels per day, and that have not the capacity to flow naturally, have established potentials, which in turn are imposed upon a Composite Withdrawal Decline Curve to determine well allowable. This pertains to more than 4000 pumping wells, each of which must, or has, obtained a potential test by pumping. In addition to this number, new completions, both in the widcat and in proven territory, must receive a potential rating by means of the customary test.

Equitable restrictions of the physical characteristics of pumping machinery and dependent parts have been incorporated into these tests in order to obtain a gauge reflecting as nearly as possible the actual ability of a well to produce. These factors relate principally to equipment, but likewise cover items necessary to accurate check of production.

Briefly, potential tests are ordered to run for eight hours, subdivided into two 4-hour continuous runs. The four-hour period in which the least amount of crude is produced, multiplied by 6, is the established 24-hour potential. Tubing pumping only is permissible, no other manner of lift being acceptable for state testing, although daily production may be produced by whatever means or manner of equipment is desired by the operator. Length of the stroke of pumping units is limited to 54 inches and the tubing diameter is limited to 3 inches.

The production of all wells is pumped directly into permanent lease storage, and this storage must be blocked or sealed from other tankage on the same or adjacent property. Upon completion of test the wells are prorated upon the curve unless in excess of the 2500 barrel upper limit, in which case they may produce the maximum allowable. Pool potentials are modified by the pool allowable. When the status of a well is changed, as from a flowing well to a pumping well, a new potential test is required of the well in the medium in which the production is to be gained. Wells deepened to another pay, or plugged back to a higher strata, are retested. A ten dollar fine may be imposed upon any operator who is not ready to test at an agreed time, or who, through improper operation, causes breakdown resulting in incomplete test. This fine is imposed in the nature of an "Assessment of $10.00 shall be made for each additional supervised test until the same is completed," under Rule 118. Witnesses should consist of at least



The manner employed by some Western Kansas operators for hooking up guy wires to reduce "shimmy" or vibration of the beam hanger, which might result in either reducing the lifted volume of crude, or a costly shutdown for repairs during potential tests.

one state engineer, one producer witness and one offset witness.

Potential Equipment

In view of the varied problems to be met in order to obtain a satisfactory potential on witnessed test, a variety in the types of pumping units is to be expected. There has been but little effort toward standardization, even within individual firms themselves. Two classes that are general develop from an analysis of the units used most frequently. These are the replacement units particularly adapted to potential test loads and horsepowers, and the other class is that covering increases in the power of standard or normal pumping units.

As for the heavy units used solely for testing, they range in horsepower from a general low of around 50 horsepower to as high as 120 horsepower, and in some cases even higher. Such power is far above the requirements for normal pumping, and in use as testing machinery the horsepower is converted into speed of rod movement or strokes per minute. Depths average approximately 4000, seldom exceeding 4600 feet, and only infrequently falling in more shallow formations than those at 2800 feet. As a consequence the energy is not proportional to the per foot barrel of lift.

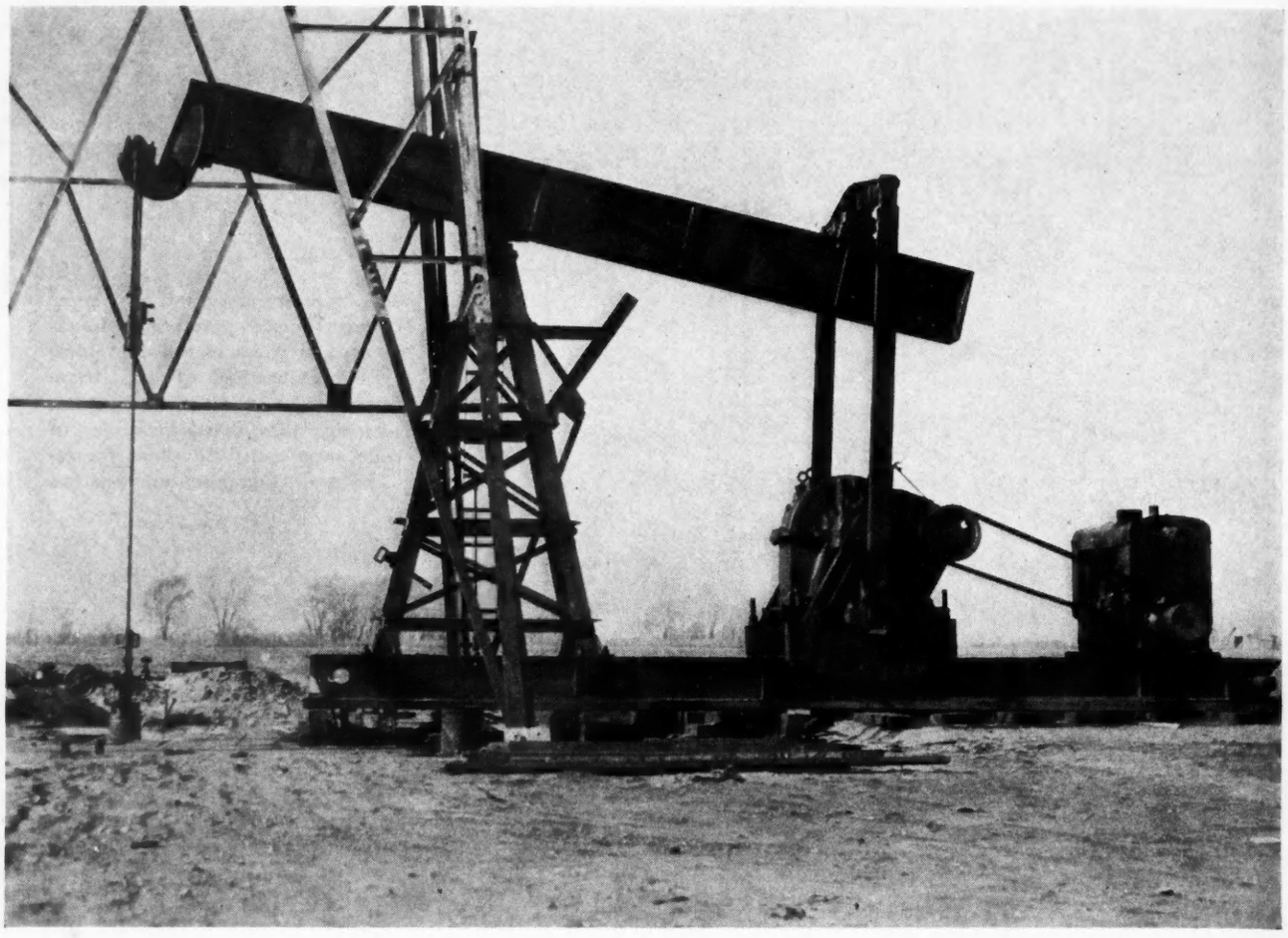
With the length of the stroke limited at the surface to 54 inches, and the tubing to three inches, the speed of the equipment is raised through the applied power to deliver a common 40 to 42 strokes per minute during test. In some instances this speed has been further increased to 45 and 46 strokes per minute although it is seldom that this pace is continued over more than a short time.

Many potentials are taken with standard fronts, with band wheel and jack post replaced with reduction gears. This allows a quick means of putting the well to regular production, and with suitable power, the tests are generally satisfactory.

A number of portable units are in use and are moved from well to well solely for potential tests, or to pump the allowable from a recent completion prior to the installation of regular equipment. A unit of this type is shown in an accompanying illustration. Although the manner of arrangement is not a set design, the post, crank and power are usually on the same bed. This is convenient in moving from one location to another, and decreases the time required for setting up and adjusting. The load weight of such units is admittedly high, and cannot be distributed as can the weight of separate pieces, but the desirable features usually overbalance the disadvantages.

Regular installations of pumping equipment on steady production are usually of comparatively low horsepower, and not in the same class rating as the potential equipment. In order to overcome this low power, boosters are often employed on minimum horsepower units when used as potential test powers. These may be of the rider type, increasing the delivered power of a belt drive, or may be auxiliary motors or engines unitized with the regular equipment for the test. Tractors and other readily portable engines are used for this purpose frequently.

The use of extra heavy horsepower drives for pump drives makes necessary the use of equally heavy supplementary equipment. Sucker rods are ¾-inch or larger, the most general size being either ⅞ or 1-inch. Some operators prefer strings having a single size rod from top to bottom, others prefer part of the string to be 1-inch and the remainder to be ⅞-inch. There is a very definite demand in the area for rods larger than the 1-inch size, and anticipating this demand



One of the entirely portable units used almost exclusively for the taking of potentials on lime wells of the area now under development in western Kansas. The entire piece of equipment is skid mounted, and with power, counterweights, beam, skid, etc., weighs about 20,000 pounds. Other similar units are designed along the same general line.

specifications for 1⅛-inch sucker rods are already a matter of record.

In the application of high horsepower to pump operation, there is a decided tendency toward slapping the sucker rod against the tubing, and the creation of unusually strong vibrations. These vibrations are often the source of difficulty at the beam connection and many operators use a sling arrangement to dampen the tendency toward extreme displacement of the polish rod. These slings are usually part of a guide constructed in the manner of a crosshead, guyed to the derrick legs. An accompanying photograph, taken during a potential test in the lime zone of western Kansas, shows the guides in place. In order to reduce the vibration and also to nullify the effects of end slap, some installations of shock absorbers have been used. This practice is far from general, the usefulness of the present arrangement for this particular purpose being considered doubtful by many engineers.

Normal pumping equipment in the area is tending toward the twin crank. Many units are direct engine mounted and some have the power mounted on a separate foundation block. Some recent installations are of electric motors operating from company owned plants, or from sub-stations set up by electric service companies. The horsepower rating of the customary pumping equipment for the regular, prorated production in Western Kansas varies from a minimum of about 20 horsepower to a maximum of approximately 65 horsepower. There is little pumping through pull rod from back crank. Although the area is practically without central powers at this time, the future will see their introduction in many areas.

General

In view of the rating of the equipment in use in the area for potential tests, and the horsepower of the engines, some of the gained potentials at first appear to be exceedingly high. Under normal operating conditions and using a three-inch working barrel with regulation plunger, 1000 barrels per day is a very good lifted production. In the Kansas area being tested under witnesses the fluid level is generally high. Many completions have a fluid level only a few hundred feet from the surface, and the inflow in many areas is so swift that it is not possible to appreciably lower the fluid column. This fact reduces time loss and required horsepower when the pump is off bottom, increasing the lifted capacity in this manner. The speed of the plunger is far higher than normal when operating at or near 44 strokes per minute. In some instances the rods do not drop back into the hole, but are actually

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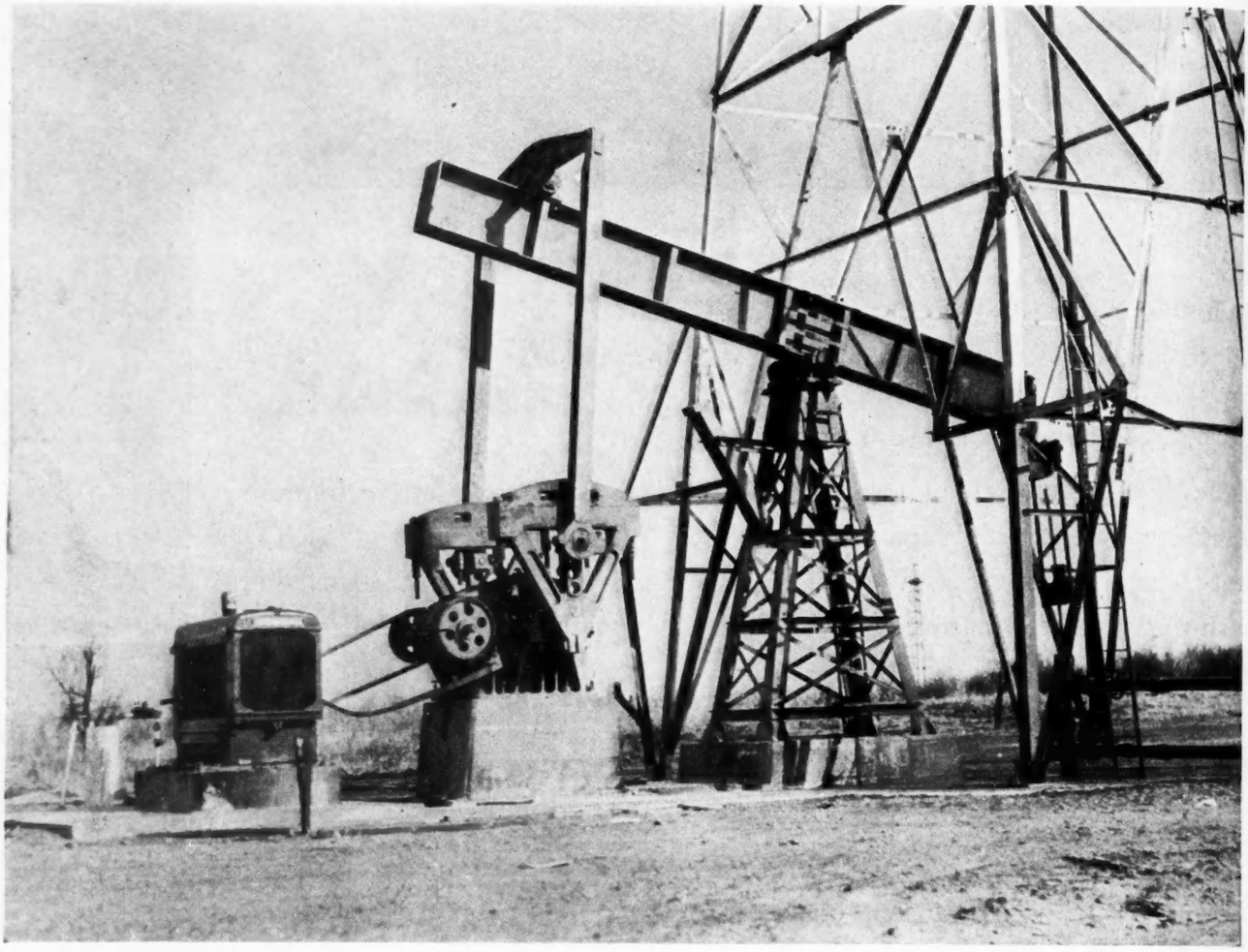

Burrton pool operation, Reno County. This medium powered unit is gas operated. Much of the power in the western area of the state is from oil as fuel, it being impossible to obtain sufficient gas. This disadvantage is now being remedied through the expansion of natural gas transmission systems to service field connections along the Central Kansas Uplift.

driven in under the high powers used during testing.

An overtravel of the plunger adds to the fluid lifted by the pump under a surface stroke length of 54 inches. In all, the action of the potential equipment results in a pumping efficiency that exceeds 100 percent by measured volume of produced crude. Two things, in adition to the overtravel of the plunger, account for this fact. First, with the high fluid levels and the rapid rate of encroachment, it is not possible to lower the fluid level to any great extent. This allows the swift pumping action to agitate, or swab the hole and a near-flowing condition is obtained. Second, the gauge of efficiency of the pump is calculated on the displacement of the pump itself, and not on the crude after it is produced and allowed to stand at atmospheric pressure. Under the pressure existing at the bottom of the hole, the fluid volume is reduced materially through pressure applied on all gas present in the crude. In some cases this reduction in volume is very great, depending largely upon the characteristics of the crude and the volumes of gas present.

In calculating the potentials, and applied powers, some tests have produced in excess of 3300 barrels based on a 24-hour continuous operation. This exceeds the 100 percent efficiency mark. At 36 strokes per minute, using a 2¾-inch plunger at 54 inches stroke, 1700 barrels (approximately) are lifted. At 42 strokes, other factors remaining unchanged, 2000 barrels are lifted in 24 hours.

Horsepower curves are comparatively regular from the slow operating speeds to about 36 strokes per minute. From this point the curve breaks into a jagged line that swiftly tends to an almost perpendicular increase. This is the function of the 3000 pounds or more polish rod load that has been measured in exceptional cases.

Western Kansas has proven a testing ground for many types of pumping equipment. Light loads from minimum wells demand one type of installation, normal pump units on prorated wells call for the customary installation, and potential tests demand the most powerful equipment that can be reasonably used. The eastern section, having very few prorated wells, is a low volume field having unnumbered light pumpers. Prorated well production in Kansas, 90 percent of which is west of zero range, averages about 5,000,000 barrels per month.

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Gulf Coast Microscopic Methods

By M. M. KORNFELD
Consulting Geologist and
Paleontologist

IT has been only a dozen years or so since microscopic methods made their entrance into the field of oil geology. In that dozen years we have seen the development to a fine degree of surface and subsurface stratigraphy, macroscopic and microscopic paleontology, and macroscopic and microscopic lithology.

Stratigraphic problems were attacked early from the surface before the advent of the microscope. Paleontology as related to prominent shell beds received also early attention. The early geologists in petroleum gave careful attention to stratigraphic and paleontologic sections wherever they could be observed.

It was when surface geology gave rise to subsurface geology that the possibilities of the microscope began to be recognized. Inasmuch as paleontology is the basis of all correlation work it was only natural that workers with the microscope should be called paleontologists or micro - paleontologists. In a way, this appellation was unfortunate, since it seemed to crystallize, in general, the idea that all workers with the microscope were interested not only primarily, but entirely with fossils.

That such is not the case becomes apparent even in the Gulf Coast Tertiary, where micro-paleontology has received a great deal of attention. Perhaps as much as two-thirds of all well sample work in the entire Mid-Continent is primarily concerned with lithology and micro-lithology. This is true particularly of the Paleozoic and Cretaceous provinces of the Tertiary. Yet in the Gulf Coast we are slow in developing methods to attack the lithologic problems represented by the Frio, Catahoula, Oakville, Lagarto, Reynosa and Lissie formations which are largely non-marine in origin.

The most careful and detailed microscopic studies of an exacting kind are needed in the field of sedimentation in the Gulf Coast today to offset the unnatural balance that has tipped the scale in favor of paleontology. Pioneers in this field have been Thomas L. Bailey[1] in surface geology and M. T. Halbouty[2] in subsurface geology.

The way is open to results from more detailed subsurface studies provided companies engaged in the search for oil and gas are willing to pay the price in additional paleontological personnel and more adequate equipment. Research is the answer to many of the problems that so far have proved difficult of analysis. Companies that can afford to do the necessary research to cover local subsurface problems (as distinguished from those of a regional nature) will find that as their geological library of carefully-examined well sections becomes complete, future wildcat tests will reveal their structural identities in the Miocene, Pliocene and Pleistocene series far above present accepted markers.

The Problem of Tertiary Sedimentation

One of the most perplexing problems that has faced the Gulf Coast oil operators and subsurface oil geologists is the correlation of the formations above the commonly accepted paleontological markers. The utter lack of regional uniformity and short lateral extent of the sands, sandstones, gumbos, clays and shales of the Upper Tertiary section have served to increase the risks of oil exploration in this region. Even shallow oil or gas fields that might have been picked up by the drill have been lost in the past because of the lack of knowledge concerning the identity of these more shallow formations and their precise place in the geologic section.

The widespread success of electrical logs in subsurface well correlations should prove the value of accurate delineation of the complex irregularities of the Tertiary sedimentary record. The fact that the alterations in the sedimentary cycle are constant for practical purposes in any given area should throw impetus into sedimentary petrologic studies. Simply because the use of electricity to record variabilities in the porosity of sediments has proven successful for correlation purposes is no reason to believe that other methods cannot be efficacious using the microscope.

In the Gulf Coast, where there has been an abundance of fossils in certain formations, the study of well samples has lagged behind similar studies in the North Mid-continent. In other words, micro-paleontology, instead of micro-lithology, has been the accepted means of attacking subsurface problems. With the advent of such electrical methods as Schlumberger log surveys, however, Gulf Coast geologists have begun to realize the value of lithologic criteria for localized subsurface correlations.

Practical Considerations in Formation Records

One of the chief reasons why well sample studies have been concentrated on the more obvious regional paleontological markers is because of the tremendous numbers of well samples that are handled daily by the larger oil and gas companies. In spite of the fact that every company of major size has several paleontogolists devoting their entire time to the study of well material the volume of work done has kept research at a minimum and allowed only the

This article has been revised and amplified since its original presentation before the Houston Geological Society, December 3, 1936, under the title of "Microscopic Methods in Localized Subsurface Geology."

[1] Thomas L. Bailey, "The Gueydan, A New Middle Tertiary Formation from the Southwestern Coastal Plain of Texas," Univ. of Texas Bull. 2645, December 1, 1926.

[2] M. T. Halbouty, "Petrographic and Physical Charicteristics of Sands from Seven Gulf Coast Producing Horizons," Gulf Publishing Co., Houston, Texas, 1937.

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hurried scanning of well samples for regional markers only.

Careful studies by the writer for over three years has revealed that, insofar as localized subsurface geology is concerned, *within any given area local changes in formation are of definite practical value to the operator, geologist, engineer, and drilling contractor.*

Hitherto, the only careful well log of Gulf Coast formations available to the geologist during the drilling of a well has been the driller's log with all its inaccuracies. The fo mation record with the mecroscope is the most accurate one that has been devised aside from electrical measurements of porosity and resistivity of formations.

Laboratory Procedure

In any analysis of well samples there are four factors taken into consideration, namely, (1) changes in lithology, (2) changes in paleontology, (3) changes in micro-lithology, and (4) changes in micro-paleontology.

Laboratory procedure to identify (1) *changes in lithology* consists of the following usual operations: the well samples are laid out in rows according to depth. A portion of each sample is emptied into a corresponding container with an identifying number. The geologic section represented by the range in depths of the well samples is thus available for inspection. The paleontologist (or micro-stratigrapher) is enabled to draw up a stratigraphic section with naked-eye changes in lithology.

(2) *Changes in paleontology*, as used by the writer, designate those occurrences of shell beds which are large enough to be seen by the naked eye. These shell zones are usually readily discernible even in cuttings and consequently, are the first definite paleontological markers determined in wildcat wells. Hence, their importance for purposes of subsurface correlation, particularly for local geology, is considerable.

TABLE 1

Detailed Report on a Typical Gulf Coast Section

CHANGE—LITHOLOGIC			**GRAVEL, SAND TO CLAY, GRAVEL, SAND**
CHANGE—MICROLITHOLOGY			**FIRST ASHY CLAYEY SANDSTONE**
542–64	Ctgs.	Clay Gravel Sand	Creamy gray clay; gravel, sand, same, lime nodules (WS) varicolored chert pebbles, colitic chert, exceedingly fine ashy argillaceous sandstone, very fine to very coarse angular to sub-angular quartz sand. No forams.
CHANGE—PALEONTOLOGIC			**FIRST HETEROSTEGINA ("MIDDLE OLIGOCENE")**
3502–22	Core	Sandstone	Light gray abundantly fossiliferous sandstone (WS) very fine hard cemented abundantly fossiliferous sandstone, pelecypods, ostrea, fish bones, Heterostegina, large Eponides.
CHANGE—PALEONTOLOGIC			**FIRST MASSILINA PRATTI—(WHITSETT-JACKSON)**
6000–20	Core	Clay Shale	Same, lignite, shells (WS) same, corals, Lenticulina (common), Cytheridea (tuberculose) Cythereis, Uvigerina common, Ammobaculites, Haplophragmoides, Anomalina, Globigerina, Virgulina, Textularia warreni, Massilina pratti rare.
CHANGE—LITHOLOGIC			**CLAY SHALE TO CLAY SHALE, SAND**
CHANGE—PALEONTOLOGIC			**FIRST TEXTULARIA HOCKLEYENSIS**
6108–30	Ctgs.	Clay Shale Sand	Medium gray to dark gray laminated clay shale, coarse sand, lignite, shells (WS) same, Textularia hockleyensis.

Note: Descriptions following "(WS)" is that of the washed sample or residue after washing operations Usually, descriptions of lithology are naked eye descriptions while those of washed samples are invariably with the aid of the microscope.

(3) *Changes in micro-lithology* are considerable and varied, running the entire range of the common light minerals for their color, size and abundance. These changes in the Gulf Coast may include the vari-colored rose-quartz and honey-yellow cherts of the Lagarto-Oakville sands, the fresh volcanic glass and feldspathic platy sands of the Catahoula, the very coarse milky-white quartz and black cherts of the Catahoula and Frio so-called "rice" sands, the exceedingly fine fossiliferous sand-

After the naked eye examinations of the well samples for changes in lithology and paleontology the well samples are prepared for microscopic study by a variety of methods. One of these methods is to heat the well sample to dryness and then disintegrate with the aid of cold water, soaking in this element for varying periods of time. The well sample is then washed through a fine screen which permits any clay material to escape leaving a clean residue containing fossils. The washed residue is then returned to its original container, dried, and then placed in an envelope or small vial for microscopic examination.

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(see opposite page)
Distributed throughout the Mid-Continent and Gulf Coast by
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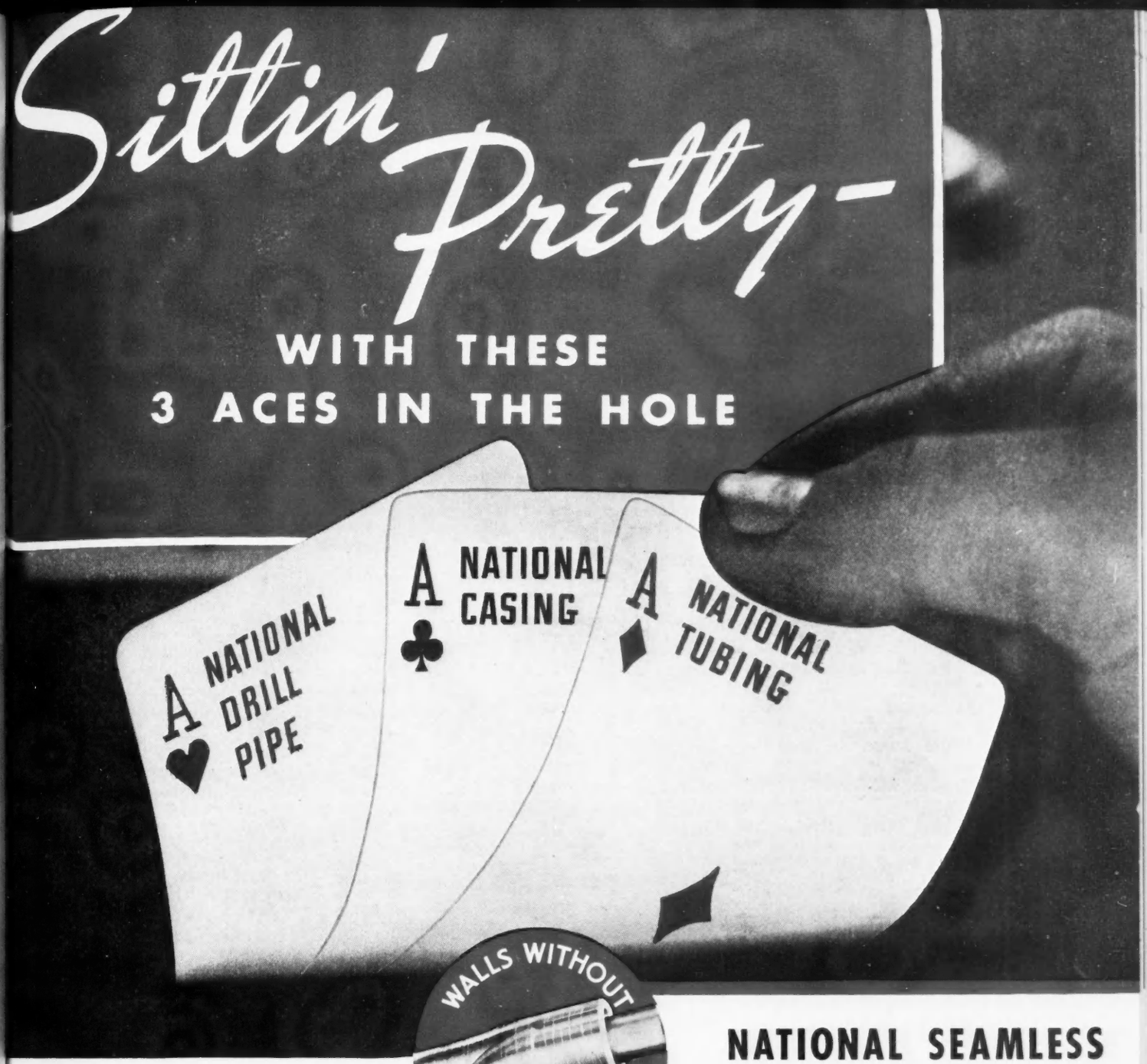

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DRILL PIPE · CASING · TUBING

YOU can rely on top cards, well matched, to win a card game—and you need top-notch equipment, well matched, to win in the oil game. The ante is heavy, and it costs plenty to stay, so make sure that you are sitting pretty, by holding these three Aces in the Hole.

NATIONAL Seamless Drill Pipe, Casing, and Tubing are ready to help you meet the toughest obstacles. When the call comes for a show-down, you'll be glad you have these three Aces working for you:

1. ***National Seamless Drill Pipe***—you'll find it where the drilling is the toughest, because of its unbeatable stamina. Strong, accurately machined threads are scientifically designed to distribute stresses evenly, so that no one point must bear more than its share of the milling load.
2. ***National Seamless Casing***—Pierced from a solid billet of open-hearth steel, it has uniform wall strength all the way around—no welds. NATIONAL A.P.I., D.B.X., and D.B.8 joints are precision made, so that they stab easily and screw together smoothly, into strong, tight, trouble-free connections.
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Here's a profit-making combination for successful drilling, casing, and tubing of wells. Place your stake on these three Aces in the Hole—NATIONAL Seamless Drill Pipe, Casing, and Tubing.

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UNITED STATES STEEL

TABLE 2

Summary of the paleontology and "naked-eye" lithology of a typical Gulf Coast section

MAIN FOSSIL HORIZONS		
3216–3238	Ctgs.	First Ostrea Shell Horizon
3324–3346	Ctgs.	First Pelecypod Shell Horizon
3502–3522	Core	First Heterostegina ("Middle Oligocene")
6000–6020	Core	First Massilina Pratti (Whitsett)
6108–6130	Ctgs.	First Textularia Hockleyensis (McElroy)

CHANGES—LITHOLOGY AND PALEONTOLOGY			
256–79	Ctgs.	Lithologic	Sand to Sand, Gravel
454–76	Ctgs.	Lithologic	Sand to Gravel, Sand
542–64	Ctgs.	Lithologic	Gravel, Sand to Clay, Gravel, Sand
630–52	Ctgs.	Lithologic	Greenish Gray Clay Horizon
696–718	Ctgs.	Lithologic	Clay to Sand
899–921	Ctgs.	Lithologic	Sand to Green Clay
1009–31	Ctgs.	Lithologic	Clay to Sand
1100–22	Ctgs.	Lithologic	Sand to Clay
1344	Bit	Lithologic	Sand to Clay
1412–24	Ctgs.	Lithologic	Clay to Sand
1618–30	Ctgs.	Lithologic	Sand to Sand, Clay
1700–22	Ctgs.	Lithologic	Sand, Clay to Sand
1744–66	Ctgs.	Lithologic	Sand to Varicolored Clay
2034–56	Ctgs.	Lithologic	Clay to Sand, Clay
2476–98	Ctgs.	Lithologic	Sand, Clay to Sand
2762–84	Ctgs.	Lithologic	Sand to Sand, Clay
3106–28	Ctgs.	Lithologic	Clay, Sand to Clay
3172–94	Ctgs.	Paleontologic	First Fish Bones
3216–38	Ctgs.	Paleontologic	First Ostrea Shell Horizon
3324–46	Ctgs.	Paleontologic	First Pelecypod Shell Horizon
3502–22	Core	Paleontologic	First Heterostegina (Middle Oligocene)

See also Kornfeld, M. M., "Subsurface Methods of the Texas-Louisiana Gulf Coast," Micropaleontology Bulletin (Stanford University), vol. 2, no. 1 (1930), pp. 8-11.

stones of the *Discorbis and Heterostegina* zones, the dark gray and black shales of the lignitic Vicksburg, the dark chocolate brown shales of the Caddell and Cockfield, and the white-speckled sandstones of the Cockfield and Upper Saline Bayou.

There are changes in micro-lithology which do not have any regional significance but are constant for short distances and hence, useful in the subsurface correlations of any given area. These localized subsurface zones or horizons may be of very little value for regional correlation but are often of definite practical importance for wildcat wells that are often the fore-runners of new oil and gas fields. Consequently, it cannot be too strongly emphasized that each wildcat well should have every well sample closely scrutinized for both lithologic and paleontologic data from the top to the bottom of the well, the top of the well being defined as the grass roots and the bottom of the well designated as the total depth.

Presentation of Data

The most striking feature of paleontological reports, as used commercially, is that in the dozen years of microscopic work there has been no important advance in the technique of presentation of data in typewritten reports. As far as the practical oil operator is concerned paleontological reports are a bewildering hodge-podge of technical data that serve to confuse rather than educate the user.

Inasmuch as each major company paleontological department uses its particular system of recording data there cannot be any fine degree of uniformity in presentation of technical data. The only important correlation of nomenclature was achieved in the summer of 1933[3] when a paleontologic "code" was recommended to correlate Gulf Coast paleontological Latin and Greek terminology with that of the more common formational names.

It is believed that the usual typewritten report of microscopic examinations of well samples can achieve a certain broad uniformity based upon the following principles: (1) a well summary placed at the head of each report, (2) a prominent under-lining or capitalization of important lithologic or paleontologic data, and (3) a brief series of remarks at the conclusion of the report to act as a clearing-house of interpretation or discussion.

Table 1, while showing only a small part of the section, is given as an example of a detailed report on a typical Gulf Coast Section. Table 2, which also shows only a small part of the section, is presented as a summary of the paleontology and "naked-eye" lithology of a typical Gulf Coast section.

The practical application of local changes in lithology and paleontology as correlated with the regional markers is seen in Table 3 of formations found in three wells in a Gulf Coast oil field. Notice how closely the local zones check the major ones such as the *Heterostegina* and the *Textularia warreni* (Vicksburg).

The careful study of well samples from the grass roots down on the above basis often enables the oil operator and the geologist to determine the presence or absence of structure far above the usually accepted markers. Such knowledge gives an operator an economic advantage in that he may determine the possibilities for oil or gas production far above the commonly accepted geological formations.

TABLE 3

Practical application of local changes in lithology and paleontology as correlated with the regional markers in three Gulf Coast wells

Well "A"		Well "B"	Well "C"
2484–2520	Dark Gray Lime Nodules (Micro)	2522–52	.....
2760–94	"Rice" Cherty Gravel Sand	2792–2822	2735–65
3516–47	First Shell Horizon (Ostrea)	3532–62	3515–45
3847–77	Coarse Sand Facies (Micro)	3872–3902	3861–92
4183–4213	Second Shell Horizon (Ostrea)	4176–4206	4155–60
4303–33	Stray Shell Horizon (Ostrea, etc.)	4336–66	.....
4395–4425	Third Shell Horizon (Ostrea)	4426–56	4400–05 (c)
4425–55	First Heterostegina Zone	4456–86	4432–62
4486–4518	Second Heterostegina Zone	4546–76	4505–28 (c)
4600–30	Fourth Shell Horizon (Pelecypods)	4636–66	4618–48
4660–90	Frio Sand	4696–4726	4678–4708
4930–60	Fine Tuff, Sandstone (Micro)	4958–88	4378–5008
5110–40	Coarse Smoky Quartz—Green Mineral Sand (Micro)	5138–58	5160–90
5263–93	Fifth Shell Horizon (Ostrea, etc.)	5351–81	5310–40
5473–5503	First Forams (Ammobaculites)	5501–31	5463–93
5563–98	First Dark Lignitic Shale	5561–91	5553–74
5901–31	Coarse "Rice" Sand	5869–90	5846–67
6233–63	First Textularia Warreni (Vicksburg)	6273–94	6241–68

Note: In the above table, the letter "c" represents "core". All other depths, undesignated, are cuttings.

[3] "Coastal Plain Stratigraphic Nomenclature," Bull. Amer. Assoc. Petrol. Geol., Discussion, vol. 17, no. 12, (December, 1933), pp. 1535-6.

MEN IN THE INDUSTRY'S NEWS

COL. W. T. KNIGHT, president of Consolidated Oil Company, and Miss Erie Wilson Ward, both of Wichita Falls, were married January 1 in Dallas in the presence of James V. Allred and Teller Ammons, governors of Texas and Colorado, respectively. Knight is a close friend of both state executives. The newlyweds departed for Miami, Florida.

A. R. EPPENAUER, president of Eppenauer Drilling Company and owner of producing properties in West Texas, has transferred headquarters of his interests to Pecos, Texas, where office space has been taken in the Brandon Hotel building. Eppenauer also holds extensive ranch properties, and the latter place will provide a more central location. Robert Imbt, chief geologist for the Eppenauer interests, will remain in Fort Worth, with an office in the Trinity Life building.

FREDERICK G. CLAPP, LESTER H. THOMPSON and HENRY HOTCHKISS recently went in conference in Meched, Iran, from which city a visit was made to an oil seepage discovered some months ago by Thompson on behalf of Amiranian Oil Company which holds the concession on that part of Iran.

FRANK HOLMESLY, with the production department of Humble Oil & Refining Company, Houston, was recently married to Miss Allene Simpson, assistant secretary to John R. Suman, vice president of the same company.

SAM E. WILSON, Corpus Christi, Texas, is making Houston his temporary headquarters, while drilling a test one mile south of the Hastings field in Galveston County.

LOUIS H. BAKER, drilling superintendent for Glenn H. McCarthy, Beaumont, Texas, was recently married to Miss Gladys Stahl of that city.

JOHN R. SUMAN of Houston, vice president in charge of drilling and production for Humble Oil & Refining Company, will be guest speaker at the annual meeting of the Midland, Texas, Chamber of Commerce to be held January 21. Midland is the hub of the petroleum industry in the Texas-New Mexico Permian basin.

EDWIN R. BROWN of Dallas, chairman of the board of Magnolia Petroleum Company and vice chairman of Socony-Vacuum Oil Company, Inc., has been awarded the 1937 Linz cup for outstanding civic work in Dallas. Brown is a former president of the Dallas Chamber of Commerce, and has taken an active interest in charity, church and political matters.

HUBERT DAVID COLLINS, petroleum engineer with Gulf Oil Corporation for 12 years, has been named field engineer and special sales representative in the Mid-Continent area for the Axelson Manufacturing Company, Los Angeles. Collins is now in the California city studying the company's policies and methods.

ERNEST O. THOMPSON, member of the Texas Railroad Commission, announced this week officially that he would be a candidate for Governor of Texas. Thompson's friends had known for sometime that he planned to make the race, despite the fact that he still has remaining four years of his term as Railroad Commissioner. He is not expected to resign from that office unless he is elected Governor.

Only one other candidate, C. E. Farmer, of Fort Worth, is an announced candidate, although Attorney General William McCraw is considered a certain prospect, and Governor James V. Allred insists that he has not abandoned the idea of running for a third term.

DR. W. P. JENNY, consulting geologist and geophysicist, Houston, has moved his office to 908 Sterling Building. His phone is Fairfax 3433.

G. E. EXLEY, superintendent for Brundred Oil Company, was toastmaster at a dinner attended by 125 employes of the company at Oil City, Pennsylvania, last week. Clyde Gordon addressed the meeting.

HERBERT A. MEYER, former assistant to the vice president of Prairie Oil & Gas Company and vice president of Sinclair Prairie Oil Marketing Company, has been named managing director of the newly organized Kansas Independent Oil & Gas Association. Meyer will represent the association at Washington and state hearings.

L. F. CLARRY has been named secretary of Commoil, Ltd., Alberta producing company, succeeding S. A. Annand, resigned.

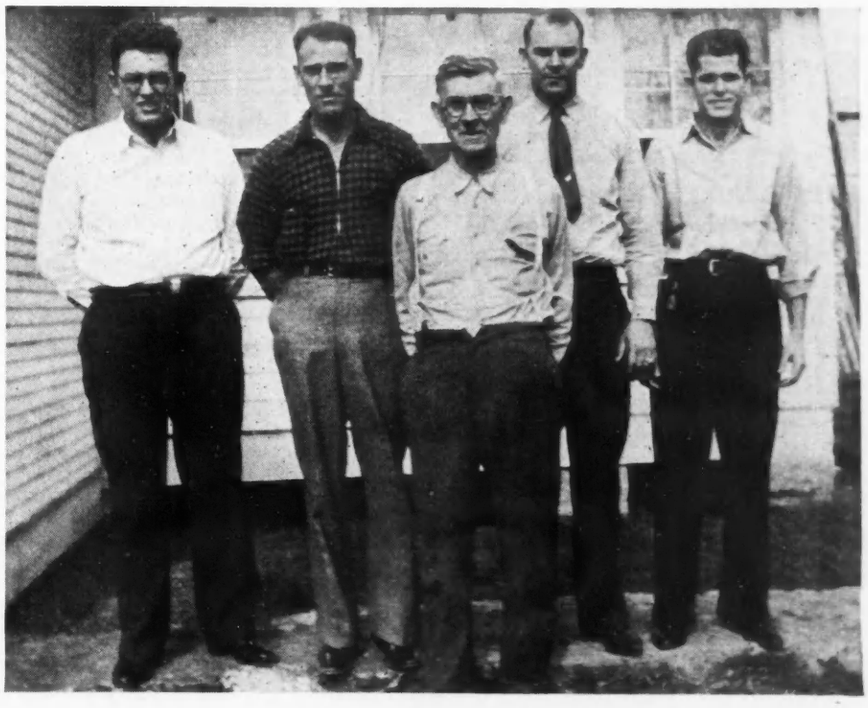
J. C. MEYERS is in charge of the Wichita, Kansas, branch office of Helmerich & Payne, Inc., drilling contractors maintaining headquarters at Tulsa, which was opened in the Brown Building last week.

B. L. BENEDUM, of Benedum & Trees Oil Company, and one of the largest contributors to the 1932 Democratic campaign fund, declared in Pittsburgh last week that business must be given the "green light" to bring prosperity, and that congress should repeal the undistributed profits tax, remove or modify the capital gains tax and, with the cooperation of the President, take determined

Head of a Gulf Family Retires

H. S. Moore (center foreground), after 33 years of continuous service with Gulf Oil Corporation, retired effective January 1, 1938. He not only held the distinction of being the oldest man in point of service with the company, but his two sons and two sons-in-law (shown with him in the picture) are also with Gulf Oil Corporation. Left to right in the back row are: John Mitchel, Howard H. Moore, Everett C. Moore, and Bill Parker.

Moore, Sr., started with Gulf Oil Corporation in 1905. His first duties were as gasoline engine man at Batson, Texas. From this location he was transferred to Sour Lake, then to Spindletop, and then to Pierce Junction, where he has spent the last 14 years of his service. Upon retirement he was superintendent in the Pierce Junction field for Gulf Oil Corporation. He was born at Bergistown, Pennsylvania, 65 years ago.



steps to bring governmental expenses in line with receipts.

"The facts about the national situation are that our national granaries are empty . . . railroads are in need of hundreds of millions of dollars worth of new equipment. . . utilities are in need of a construction program running into the billions, the country needs hundreds of thousands of new homes; inventories are low . . . there are thousands of projected developments being held in abeyance pending reassuring action by congress," he declared.

GEORGE A. BURKE, Cleveland, retired vice president of Standard Oil Company of Ohio, is a director of the newly organized Ohio Horse Breeders Association, Inc.

REX L. DAWSON, Illinois manager for Carter Oil Company, has returned to Mattoon after spending the holidays in Oklahoma.

CHESTER IMES, scout for Shell Petroleum Corporation, has taken an office in Dallas, Texas, where he plans to form a new company.

CLAUDE H. MILLER and GENEVIEVE GIVLER, of Greensboro, North Carolina, and James S. Mitchell, of Dry Fork, Virginia, have organized the Natural Gas & Equipment Company, Inc., and will maintain business headquarters in Greensboro.

B. E. SIBLEY, chief technologist for Continental Oil Company, Ponca City, Oklahoma, was recently elected a vice president of the Society of Automotive Engineers.

LAKE FOWLER, with the land department of Magnolia Petroleum Company, Houston, has returned to his desk after a brief illness.

ROGER LACY of Longview, East Texas producer and refiner, has purchased a 127-acre tract of wooded land adjacent to the Buckners Orphans Home, near Dallas, to be donated to the institution.

JESSE D. WESNER of San Angelo, Texas, driller, and his wife were injured January 3 in a head-on auto collision near Big Lake. Both were removed to San Angelo for hospitalization.

JOHN K. DORRANCE, Houston, has returned from a trip to Mexico City.

NEWTON WYLIE, head of Commonwealth Petroleums, Ltd., is president of Treaty Petroleums, Ltd., organized to develop leases in the Blood Indian Reserve, southwest of McLeod, Alberta, Canada. Dr. W. E. Spankie is first vice president, and H. S. Price is director.

LIONEL L. LINDSAY, Calgary, heads High River Oil & Refining Syndicate which is being organized to construct a refinery at High River, Alberta, Canada. D. R. Leckie, Kelowna, B. C., is secretary.

ARTHUR OLSON, drilling contractor, was delayed on his return to the Illinois coal basin area last week by a motor car accident in Missouri while on the way back from Oklahoma where he spent the holidays.

WALLACE THOMPSON, of General Crude Oil Company, Houston, was the principal speaker at the Houston Geological Society's regular weekly luncheon, at the Lamar Hotel, January 6. His subject was "Geological Cross Sections of Texas."

H. W. DeYARMETT, will be in charge of Houston branch office of the Petroleum Engineering, Incorporated. His headquarters will be in the Second National Bank Building.

ROY E. DeLAY, graduate petroleum engineer of the University of Texas, has been added to the East Texas field engineering service staff of The Parkersburg Rig & Reel Company.

EDWIN B. HOPKINS, consulting geologist and independent operator of Dallas, Texas, has left for Venezuela on business and will be gone approximately 30 days.

DR. HENRY V. HOWE, geologist of Louisiana State University, Baton Rouge, was the speaker at the January meeting of the Shreveport Geological Society held January 7. His topic was his observations concerning the geology of Russia and general conditions prevailing in that country.

MRS. HUEY P. LONG was elected president of the Win Or Lose Oil Company at the annual stockholders meeting in New Orleans last week. She succeeds Former Governor James A. Noe as president of the company. Seymour Weiss was elected vice president and Earl Christenberry was reelected secretary-treasurer. The Win Or Lose Oil Company has large holdings in various parts of Louisiana.

GEORGE H. PRATT of Amarillo, zone agent for Gulf Oil Corporation in the Texas Panhandle, visited the Fort Worth district offices of the company early last week. Pratt scouted the Panhandle before its first oil well was recorded, and is probably the oldest oil man in the district from a standpoint of continuous residence.

T. H. ANDREWS, formerly division engineer for Stanolind Oil & Gas Company, Houston, has been promoted to district superintendent in charge of the Houston district.

COL. WALTER B. PYRON, vice president of Gulf Oil Corporation, Houston, has been reappointed chairman of the Houston Chamber of Commerce aviation committee.

DIED:

DR. ALEXANDER R. KULDELL, father of R. C. Kuldell of Houston, Texas, died Wednesday, January 5, in Washington, D. C. Dr. Kuldell was a native of Germany, receiving his education there and at Capital University, Columbus, Ohio. He founded the Bible Institute in Washington, was a pastor in Pittsburgh for 25 years and later served in missionary work in Washington, Philadelphia, New York and Russia until 3 years ago, when he retired. He is survived by his wife, four sons and a daughter.

W. J. CARDEN, 67, deputy oil and gas supervisor for the Texas Railroad Commission, died January 5 at his home in Abilene, Texas. He was seriously injured in an auto mishap last March, but remained in charge of the West Central Texas proration district by transacting business with oil operators in his home and by telephone. He had served as a deputy supervisor for 15 years.

CLAY JOHNSON WEBSTER, 59, died January 2. He was president of National Oil Company and C. J. Webster Oil & Gas Company of San Antonio. He was one of the most active wildcat operators, having drilled wells in many parts of Texas.

EDWARD J. McKEE, 54, connected with oil development for 25 years and founder of the petroleum department of the Missouri School of Mines, died December 31 in a Dallas hospital after an illness of several months. He came to Dallas less than a year ago from Oklahoma City and at the time of his death was general superintendent of Barnett Petroleum Corporation.

JAMES RIFENBERG, 70, an outstanding figure in Western Pennsylvania oil development, died at Waynesburg, Pennsylvania, December 30 of pneumonia. He was a native of Venango County.

JAMES SMITH, 70, for many years construction superintendent for Gulf Refining Company, died December 30 at his home in Pittsburgh.

New Oklahoma field lease deal made

Tulsa.—Reported to be the first lease sale around Mid-Continent Petroleum Corporation et al's Ramsey 1, wildcat strike in Payne County; J. E. Crosbie, Inc., January 5, obtained 40 acres in SW NW of 13-18n-1e, from C. S. French. Consideration was stated to be $250 in cash and $250 in oil. The land is ¾-mile southwest of the 10,000-barrel well, which is located in SWc NW 18-18n-2e, 5 miles southwest of Stillwater. Area immediately adjacent to the well is leased solid.

Oklahoma A. P. I. to meet January 12

Bartlesville, Okla.—First meeting of 1938 for the Northeast Oklahoma Chapter, The American Petroleum Institute, will be held here January 12, it was announced by F. W. Floyd, Carter Oil Company, chairman of the chapter. The program, in charge of C. S. Warren, Cities Service Oil Company and L. H. Thawley, Phillips Petroleum Company, will include a trip through the Reda Pump factory and the new Bureau of Mines building here. Evening meeting, beginning at 8:00 in the Empire Masonic building, will include selections by the D.M.F. glee club; a moving picture "Through Oil Fields of Mexico," presented by the Bureau of Mines, and a paper, "Circumferential Field Welding of Casing," by L. R. Hodell, Carter Oil Company, Tulsa.

Crude Getting Shaky

Continued weakness of gasoline market and less strict production control gives weak support for crude prices which are unchanged

IN THE opening portion of the new year the markets of the oil industry have remained generally unsettled, and prices have continued unsteady.

The gasoline market remains weak, and the outlook still is not very promising.

The crude oil market has continued to hold at the established price level, but there are still some fears of downward revisions of postings.

Allowables Less Strict

The crude oil market is in a less favorable position, following the inauguration of new allowables in the leading producing states for January.

These allowables are somewhat less strict than in former months, and probably will result in stationary crude stocks in January, compared with declining stocks in recent months.

Gasoline Market Weak

The weakness that has characterized the gasoline market in recent months still persists. Tank car prices at refineries during the past week lost additional ground in some instances, and retail prices were relatively weak in various districts.

Gasoline Stocks Excessive

Contributing largely to the weak gasoline market is the excessive inventory of that product. The present stocks of gasoline in the United States are 23.3 percent greater than at this time a year ago. This increase in stocks within the year is not justified by the market conditions. The Bureau of Mines have estimated that demand for gasoline by consumers in the United States in January will be only about 8 percent greater than in January 1937, although continued brisk export business is expected to make the total gasoline demand for January 10 percent higher this year than last year.

Moreover, there is not in prospect any immediate improvement in the gasoline situation. For the next several months it is to be expected that gasoline stocks will be on a steady increase. This increase appears inevitable as the cold weather and heavy consumption of fuel oil are forcing the industry to turn out large amounts of gasoline along with the fuel oil that is needed to fulfill the market requirements. Consequently, further additions to gasoline storage are in prospect for the next several months.

Crude Market Affected

This unfavorable gasoline situation naturally is reacting unfavorably on the crude oil market. And for the next several months, at least, the industry probably will have difficulty in maintaining the present crude oil postings, in the face of the gasoline market weakness.

Probably the most effective action that can be taken to save the present crude prices is to maintain henceforth exceptionally strict control of crude production. Unusually effective control of the wells of the country in the closing months of 1937 undoubtedly did much toward holding crude postings at the established levels.

Latest Statistics

Except for figures on gasoline storage, the statistics of the industry remain generally satisfactory.

Operations have continued moderate at both the wells and the refineries in recent weeks.

During the week ended January 1, United States crude oil production averaged 3,436,600 barrels daily, which was 56,000 barrels a day less than in the previous week and 9.9 percent more than in the corresponding week last year. This increase over a year ago is largely justified by the fact that petroleum demand has been running lately about 10 percent greater than at the corresponding time last year.

Crude oil runs through stills in the week ended January 1 averaged 3,320,000 barrels daily, which was 75,000 barrels a day more than in the previous week and 9.6 percent more than in the similar week a year ago. The refinery operations therefore were in about the same favorable relation to petroleum demand as the crude oil production.

Current Inventories

Aside from the excessive gasoline stocks, the oil inventories that the industry has on hand remain generally advantageous.

Crude oil stocks have been declining consistently for the past three months. This favorable situation resulted from the unusually strict control of crude oil

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 27	3,431,300	3,060,000	293,587,000	*83,538,000	96,591,000
April 24	3,496,400	3,125,000	300,737,000	82,303,000	94,100,000
May 29	3,573,000	3,245,000	306,445,000	78,758,000	96,139,000
June 26	3,529,600	3,235,000	307,679,000	75,427,000	100,395,000
July 31	3,591,900	3,425,000	308,250,000	70,872,000	108,209,000
August 29	*3,731,450	3,425,000	309,506,000	66,997,000	112,111,000
September 25	3,666,300	*3,455,000	307,974,000	65,620,000	116,472,000
October 2	3,647,450	3,400,000	309,036,000	65,266,000	117,076,000
October 30	3,602,950	3,345,000	307,140,000	66,836,000	121,070,000
November 27	3,425,800	3,325,000	304,156,000	68,544,000	121,616,000
December 4	3,387,000	3,230,000	303,034,000	70,193,000	121,329,000
December 11	3,414,450	3,200,000	303,163,000	70,513,000	120,154,000
December 18	3,439,850	3,220,000	303,041,000	73,288,000	119,919,000
December 25	3,492,600	3,245,000	.....	74,437,000	118,659,000
January 1, 1938	3,436,600	3,320,000	.....	77,291,000	118,660,000
January 2, 1937	3,129,950	3,030,000	†288,184,000	62,661,000	106,330,000
Change in past year	+9.9%	+9.6%	+5.2%	+23.3%	+11.6%

* All time peak. † Stocks December 19, 1936.

production that prevailed under the allowables of the leading producing states.

The present crude stocks are relatively small, being only 5.4 percent larger than the inventories on hand a year ago, whereas the demand for petroleum has been showing an increase of around 10 percent.

More Michigan Cutting

The weakness of the crude market in Michigan was further demonstrated last week. Effective January 5, Pure Transportation Company put into effect a 15-cent reduction of postings in Midland-Isabella and Gladwin counties. New prices are: $1.12 a barrel for the Midland and Isabella County grades; and $1.09½ cents a barrel for Gladwin grades. McClanahan-Leonard met the price reduction.

Fuel Oil Market

The fuel oil market has continued strong, by virtue of the heavy demand for the burning oils for domestic heating. Fuel oil prices last week were generally unchanged from the previous week, but increases have occurred in some recent weeks.

Fuel oil stocks on January 1 totaled 118,660,000 barrels, having been increased 1,000 barrels during the week. These present stocks are 11.6 percent greater than those held at this time last year. However, the consumption of fuel oil has been running lately about 15 percent greater than a year ago.

Gasoline storage in the United States increased 2,854,000 barrels in the week ended January 1, rising to a total of 77,291,000 barrels. At that level the gasoline stocks were 23.3 percent larger than one year previously.

Refinery Prices

U. S. motor gasoline ranged in the Oklahoma market last week about as follows: 62 octane and below, 4 to 4¼ cents a gallon; 63 to 66 octane, 4⅜ to 4½ cents; 67 to 69 octane, 4⅝ to 4⅞ cents; and 70 to 72 octane, 4⅞ to 5¼ cents.

Corresponding prices in the Chicago market were as follows: 3¾ to 4¼ cents, 4 to 4½ cents, 4⅜ to 4⅝ cents, and 4½ to 5 cents.

In East Texas the most common gasoline, 60-62, 400 end-point, was priced generally at 4⅛ to 4¼ cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 4⅛ to 4⅜ cents a gallon for the 41-43 water white grade, and from 4¼ to 4½ cents for the 42-44 water white grade. Corresponding prices in the Chicago market were: 4⅛ to 4⅜ cents and 4¼ to 4⅝ cents.

Fuel oil prices were mostly unchanged. In the Chicago market range oil was priced from 4⅛ to 4½ cents a gallon. The No. 1 white oil was priced from 4⅛ to 4⅜ cents, and the No. 1 straw from 3⅞ to 4⅛ cents. No. 2 straw was 3¾ to 3⅞ cents and No. 2 dark from 3⅝ to 3¾ cents. No. 3 oil was 3½ to 3⅝ cents. No. 4 was $1.05 to $1.10 a barrel to domestic consumers and 95 cents to $1.10 to industrial buyers. No. 5 oils were 80 to 85 cents for domestic and 77½ to 85 cents for industrial sales. The No. 6 oil was quoted to the usual industrial customers at 55 to 65 cents a barrel.

Wichita.—Kansas operators completed 23 wells last week, 17 of which were for oil, making 20,348 barrels. There were no gas wells and 6 dry holes. First reports increased to 29 for the week, Barton County first with 5. Ellis had 4; Butler, Ellsworth and Russell 3; Reno, Rice and Stevens 2, and there was 1 each for Greenwood, McPherson, Rooks, Stafford and Woodson counties.

CRUDE OIL PRICES

Complete tables of prices paid for crude oil at the well in principal fields is shown on page 46 of the issue of January 3. This schedule will appear only in the first issue of each month.

Summary of Wells Completed in the United States Week Ending January 8, 1938

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total, 1938	Total this Date, 1937
Alabama	....	....	....	....	.....	....	...
Arkansas	6	5	1	....	7,184	10	...
California	17	14	1	2	5,220	33	32
Colorado	2	....	....	2	.....	2	2
Florida	....	....	....	....	.....	....	...
Illinois	18	9	....	9	2,084	43	...
Indiana	....	....	....	....	.....	....	...
Kansas	23	17	....	6	20,348	68	64
Kentucky	11	3	6	2	75	35	24
Louisiana	32	16	....	16	12,841	39	19
Michigan	7	4	....	3	1,210	29	43
Mississippi	....	....	....	....	.....	2	...
Montana	....	....	....	....	.....	2	6
Nebraska	....	....	....	....	.....	....	...
New Mexico	10	10	....	....	13,302	19	23
New York	....	....	....	....	.....	2	...
Ohio	16	4	8	4	152	37	66
Oklahoma	30	20	3	7	1,509	72	106
Pennsylvania	3	2	1	....	80	7	...
Texas	242	175	10	57	279,519	452	453
Utah	....	....	....	....	.....	....	...
West Virginia	20	3	14	3	4	37	16
Wyoming	1	....	....	1	.....	2	6
Total this week	438	282	44	112	343,448	891	860
Total last week	453	295	40	118	317,346	....	...
Total this year	891	577	84	230	660,794	....	...

Comparison of Permits Granted for New Wells

STATE	Week Ending Jan. 8	Total this Mo.	Total this Year	Total this Date Last Year	1937 Year Total
Arkansas	2	4	4	....	240
California	47	83	83	35	1,584
Louisiana	29	49	49	....	1,227
Kansas	29	52	52	83	2,663
Michigan	11	23	23	22	958
Oklahoma	21	55	55	107	2,711
Texas	126	231	231	377	17,238
Total	265	497	497	624	26,621

Production Decreases Further

Drop of 23,550 barrels daily average leaves output still above figure set by Bureau of Mines and of most state proration boards.

ALTHOUGH state allowables for the principal producing states have been increased for January, United States crude oil production showed a further decline, having averaged in the week ended January 8, 3,443,275 barrels a day. That was 23,550 barrels less than in the previous week, but still 36,475 barrels a day above the Bureau of Mines recommendation for January.

The decrease was due to a smaller output in Texas, Kansas and New Mexico, which greatly exceeded slight increases in California, Oklahoma and Louisiana.

Texas output was 17,300 barrels a day lower than in the previous week, averaging 1,380,700 barrels daily, which was 29,800 barrels more than the Bureau of Mines recommendation and 23,127 barrels more than the allowable prescribed by the state.

Kansas production decreased 3950 barrels to 162,650 barrels a day, which was 16,650 under the indicated demand and 23,822 barrels a day below the state allowable.

New Mexico likewise showed a small decline of 600 barrels, having averaged during the past week 107,100 barrels daily. That was 4000 barrels more than the Bureau of Mines estimated demand.

California Increases

California last week averaged 710,000 barrels a day, 1000 more than in the previous week, and 31,700 barrels a day more than the Bureau of Mines recommendation, as well as the recommendation of the Central Committee of California Oil Producers.

Oklahoma likewise showed a gain of 5150 barrels, averaging 538,825 barrels a day, which was 27,775 barrels daily above the indicated demand and 11,175 barrels more than the state allowable.

Louisiana output increased 5925 to 252,875 barrels a day, which was 14,475 barrels more than the federal allocation, but remained 3125 barrels under the allowable prescribed by the state.

Swedish interests form oil purchasing company

Important Swedish shipping interests, owning 35 passenger and cargo vessels, recently announced the formation of an oil purchasing company which will buy and store all fuel oils used by the operating vessels, according to a report by the American Consulate at Goteborg, made public by the Department of Commerce.

The new company, which will be known as the Brostrom combine, will have a capital stock of approximately $600,000 and will construct an oil depot at Goteborg very shortly with a capacity of 16,000 metric tons, the report stated.

The vessels operated by the Brostrom interests are all motor driven and call at almost every principal port in the world, according to the report.

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Jan.)	State Allowable in January	BARRELS DAILY FOR WEEK ENDING January 8	January 1
TEXAS—				
Texas Panhandle	.....	.....	71,600	72,300
North Texas	.....	.....	72,800	73,100
West Central Texas	.....	.....	33,100	33,100
West Texas	.....	.....	193,200	192,100
East Central Texas	.....	.....	86,200	93,700
East Texas Field	.....	.....	492,100	490,300
South Texas	.....	.....	236,400	250,200
Texas Gulf Coast	.....	.....	195,300	193,200
Total Texas	1,350,900	1,357,573	1,380,700	1,398,000
CALIFORNIA—				
Long Beach	.....	.....	58,000	58,000
Santa Fe Springs	.....	.....	40,500	40,500
Huntington Beach	.....	.....	35,500	35,000
Dominguez	.....	.....	30,000	29,500
Inglewood	.....	.....	16,000	14,500
Ventura Avenue	.....	.....	38,000	36,500
Seal Beach	.....	.....	9,200	9,200
Midway-Sunset	.....	.....	78,500	73,500
Elwood	.....	.....	7,500	7,500
Kettleman Hills	.....	.....	80,000	82,000
Mountain View	.....	.....	15,000	14,500
Playa del Rey	.....	.....	7,500	7,500
Wilmington	.....	.....	62,500	62,000
Others	.....	.....	231,800	238,800
Total California	678,300	*678,300	710,000	709,000
OKLAHOMA—				
Oklahoma City	.....	.....	120,975	109,550
Seminole Area	.....	.....	104,775	104,600
Crescent	.....	.....	8,025	7,750
Lucien	.....	.....	11,300	12,250
Fitts	.....	.....	68,850	73,300
Edmond	.....	.....	9,200	10,250
Moore	.....	.....	9,300	9,750
Others	.....	.....	206,400	206,225
Total Oklahoma	566,600	550,000	538,825	533,675
LOUISIANA—				
North Louisiana	.....	.....	78,375	76,250
South Louisiana	.....	.....	174,500	170,700
Total Louisiana	238,400	256,000	252,875	246,950
KANSAS—				
Ritz-Canton	.....	.....	5,100	5,125
Chase	.....	.....	4,550	5,000
Hollow-Nikkel	.....	.....	2,325	2,375
Sedgwick	.....	.....	3,425	3,600
Burrton-Haven	.....	.....	10,225	10,300
Lorraine	.....	.....	2,425	2,675
Russell County	.....	.....	28,475	29,825
Silica-Isern	.....	.....	9,875	9,250
Others	.....	.....	96,250	98,450
Total Kansas	179,300	186,472	162,650	166,600
NEW MEXICO	103,100	107,100	107,100	107,700
MICHIGAN	54,100	.....	49,600	50,800
ARKANSAS	35,200	.....	42,525	49,800
MOUNTAIN STATES—				
Wyoming	55,500	.....	48,700	49,600
Montana	13,100	.....	13,700	13,600
Colorado	4,300	.....	4,400	4,500
Total Rocky Mountain States	72,900	.....	66,800	67,700
EASTERN STATES—				
Pennsylvania Grade	.....	.....	76,800	81,500
Southern Illinois (New Pools)	.....	.....	24,100	24,000
Illinois-Indiana (Old Pools)	.....	.....	10,200	10,100
Others, Eastern	.....	.....	21,100	21,000
Total Eastern States	128,000	.....	132,200	136,600
Total United States	3,406,800	.....	3,443,275	3,466,825

* Recommendation of Central Committee of California Oil Producers.

WORLD DEVELOPMENT and TECHNOLOGY

Edited by
WM. V. GROSS, Associate Editor

Cut Freight Rates

Canadian railroads competing with pipe lines in fight to ship Turner Valley crude; wildcat shows

THE Canadian Board of Railway Commissioners last week ruled that lowered freight rates for crude from the Turner Valley field of Alberta shipped to Regina refineries, recently granted on train-load shipments, shall also apply to car-load shipments. The decision makes it possible for small plants to utilize Alberta crude and should give additional relief to Turner Valley operators who are now held to 35 percent proration. The rate is 19 cents per 100 pounds for shipments from Calgary to Regina, which amounts to 1.52 cents per Imperial gallon. Railway companies favored the decrease when made on train-load lots a month ago, declaring the lower rate was necessary to meet the competition of a possible pipe line from Turner Valley to Regina.

More Refineries

Turner Valley operators look toward increased refining facilities, both in the vicinity of the field and at Regina, early in the year to further aid in marketing crude. Economy Oils, Ltd., plans to open a 500-barrel plant on the Century lease in the south end of the Valley before the end of the month. Organization of the High River Oil & Refining Syndicate was to be completed this week and work started immediately on a 300-barrel plant at High River, Alberta. Imperial Oil Company, Ltd., has announced a $500,000 expansion program for its Calgary plant, and a $350,000 expansion of its Regina plant, which when completed will provide an outlet for about 4000 more barrels of Turner Valley crude. Work on the Calgary project is still in the paper stage, but actual construction is expected to be underway early in the year.

The weather, combined with the usual holiday lull, materially slowed Alberta operations during the past two weeks. Temperatures ranged from 18 to 28 below zero, freezing water lines, disrupting telephonic communication and making transportation of materials difficult. Precautions were being taken to prevent bursting of gas lines in the event of a rapid rise in temperature.

Announcement of an Alberta oil development program that may call for an expenditure as high as $10,000,000 by eastern financial interests, was made by Newton Wylie, president of the Commonwealth Petroleums, Ltd., and Gordon Plaxton. Sydney A. Annand, formerly secretary and treasurer of the Commonwealth company, has been named Calgary manager for the group, and Treaty Petroleums, Ltd., has been organized for development of 26,000 acres in the Blood Indian Reserve, southwest of McLeod. It was indicated that other companies would be organized for development programs in other parts of the province.

Developments in the Montana fields described as of a "disturbing and threatening character" were blamed for a 22-cent reduction in the price of crude in Turner Valley, Alberta, made January 5 by Imperial Oil Company, Ltd. The new price for average gravity crude of 46 degrees is $1.26 a barrel.

Offsetting to a slight degree the crude price cut was a reduction from 17 to 15 cents a barrel in the charge for gathering crude in the field and carrying it to Calgary, refining and shipping point, and a cut from 10 to 5 cents a barrel in the charge for receiving, storing and loading the oil. It is believed the reduction in the latter charge will encourage small refineries to purchase Turner Valley crude in place of United States crude now used in many plants.

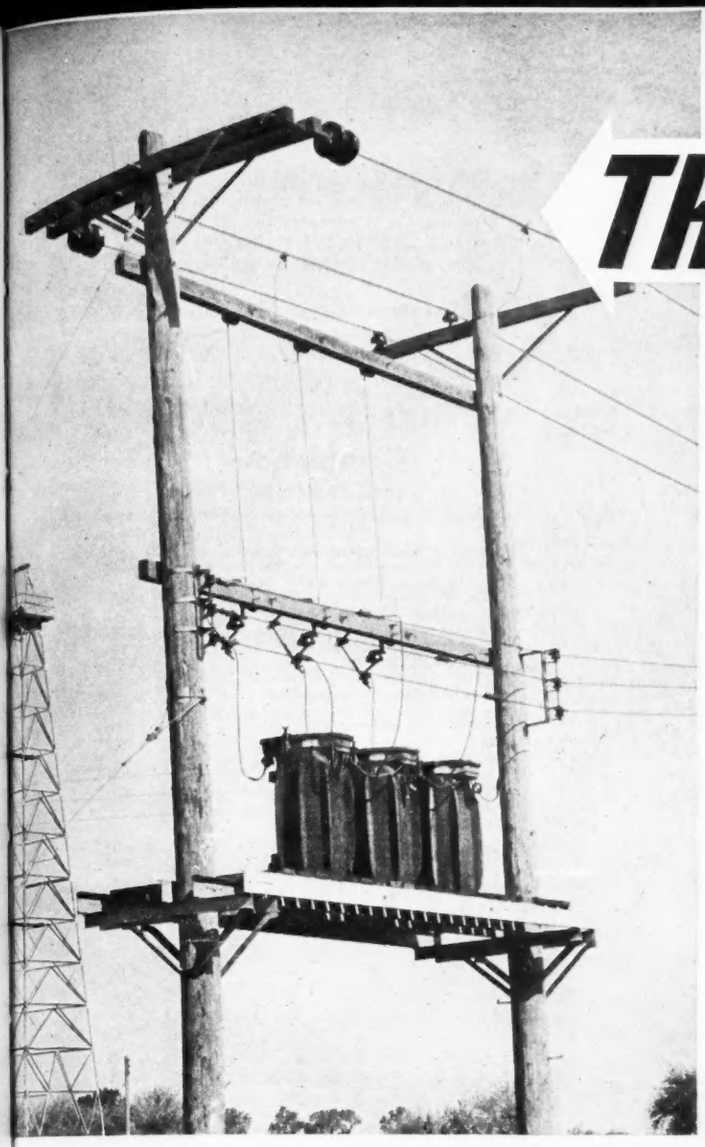
Production of Sunset Oils, Ltd.'s 1, Legal Subdivision 10, Section 20, Township 18, 2-w5, on the outside edge of the west flank of Turner Valley, was confirmed at 1000 barrels daily, the estimated figure when completed at 7475 feet a week ago. West Flank Oil Company, Ltd.'s 3, Legal Subdivision 8, Section 32, Township 18, 2-w5, completed a week ago at 6870 feet, is to be acidized before production figures are given. Unofficial estimates by those who visited the well set production at about 800 barrels daily.

Cores Oil Sand

East of Wainwright, on the Battleview structure, Pacalta Oils, Ltd.'s test yielded a core showing seven feet of gas sand and 15 feet of oil sand, the latter described as carrying "considerable" saturation. The test is being drilled lower on structure than Battleview Oils, Ltd.'s 1, discovery which has a daily gas flow of 50,000,000 cubic feet, in an effort to obtain crude. However, the gas pressure at the Pacalta test is very heavy.

Plains Petroleum Corporation, Ltd., failed to find commercial production in the Clancy sand in No. 3 and was preparing to deepen from 3106 feet to the 3300-foot level. The company is starting work on Nos. 4 and 5 on its 8-well program planned for the Taber structure. Location of No. 3 is Section 25, Township 9, 17-w4.

Drilling was resumed last week on many wildcat structures which had been inactive over the holidays, several tests showing marked progress since the last report. Following is the status of other Alberta wildcats as the week closed: on Birch Ridge structure, Elbow Oil Company, drilling at 5312; on Brazeau structure, Home Oil Company's Brazeau 1, drilling at 100 feet; on Calling Valley, Sentinel Oils, drilling at 6400 feet; Anglo-Indian Oils Corporation, derrick up; on Cardston, Franco Oils, waiting at 4580 feet; on Clearwater, Western Development Company, idle at 142 feet; on Del Bonita, Lyons-McIntyre, waiting at 420 feet; on Duncan, Spindletop Oils, drilling at 2315 feet; on High River-Aldersyde, Ranchmen's Oil Company, resuming from 7230 feet; on Highwood-Sinclair, Green Valley Petroleum's Banner 1, cemented at 4811 feet; on Hunter Valley, Hunter Valley Oil Company, Ltd.'s 1, waiting at 8274 feet; on Kootenay Dome, Roxana Petroleums, standing at 3790 feet; on Lethbridge, Lethbridge Petroleum & Refineries 1, cemented at 2300 feet; on Moose Dome, Moose Oils' 2, testing at 1553 feet; Model Oils' Canyon 1, waiting at 184 feet; on New Valley, New Valley Oil Company, waiting at 8462 feet; on Pincher Creek, Weymarn Petroleums 2, waiting at 6432 feet; on Ribstone, Dina Oil & Refining Company's 4, drilling at 1150 feet; London-Ribstone Petroleums' 2, testing with



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ADVANCES $25,000,000 FOR VENEZUELAN OIL

Mene Grande Oil Company, an affiliate of the Gulf Oil Corporation engaged in Venezuelan development, has concluded an agreement with International Petroleum Company, Ltd., of Toronto, Canada, which will assure the Mene Grande of an outlet for its surplus production of crude oil for a long term of years. At present, the company is producing in excess of 70,000 barrels a day from its Venezuelan properties, about half of which is marketed in the United States. The remainder will be purchased by International.

No change in the ownership of the Mene Grande concessions or in the operations of the properties is involved. The purchaser of the oil has anticipated future deliveries it will receive by an advance payment to the Mene Grande Company of $25,000 000. The Imperial Company, parent of International, is controlled by Standard Oil Company of New Jersey.

no depth reported; on Steveville, Anaconda Oil Company, waiting at 1207 feet; on Taber, Amerada Oil Company, derrick up; on Wainwright, Battleview Oils, Ltd.'s 2, spudding; Wain-Town Oil & Gas Co., drilling with no depth reported; Altoba Oils, derrick up, on Watson, Mar Jon Oil Company's 3, waiting at 5520 feet; No. 5, cellar dug; Mar Jon-Maxmont Syndicate 4, drilling with no depth reported.

On Sage Creek in British Columbia, Columbian Oils was drilling below 6504 feet at last report.

New map of Alberta

The Alberta department of lands and mines has published a new geological map of the province which was compiled by Dr. J. A. Allan, of the department of geology at the University of Alberta. The topographical and geological data shown on the map were compiled from maps and reports published by the Topographical Survey, the Geological Survey of Canada, and the Research Council of Alberta.

The map is printed in 15 soft tints, each color representing a certain division of geological time which is represented in the legend. On the black base is shown the geography; the geological boundaries; the culture, including the township and range lines; all railways; cities and several towns. All surveyed lines, including the base lines, are shown.

Poland ends year with two gas reserve discoveries

Poland closed the year with discovery of a Miocene gas reserve that will be valuable to the heavy industry community being developed around Sandomierz. The discovery well, a project of Spolka Naftowa "Pollon," located eight kilometers from Debnica and in the county of Przybor, was completed at 723.8 feet for about 1,500,000 cubic feet of gas daily. Drill stem was reported to have been hurled more than 250 feet into the air when the gas was encountered.

While recently looking for oil at greater depths in Boryslaw field, Polmin Oil Company recently found a flow of gas at 398 meters depth which gauged 100 cubic meters per minute and 35 atmospheres pressure. (An atmosphere equals 14.7 pounds.)

Production Down

Production of crude oil in Poland in September continued on the downward trend, 41,310 metric tons being recovered, according to figures released in December. This amount may be compared with 42,450 tons in August, and 43,210 tons in July. Poland's production in June was 40,850 metric tons.

Thirty wells were completed in Poland in September as against 31 in August. Domestic consumption of oil derivatives in September totaled 36,222 tons, and exports amounted to 10,047 tons. Refineries produced 37,516 tons of derivatives from a run of 41,000 tons. Refinery runs and production were slightly in excess of those of August.

Production in metric tons from the three leading Polish oil areas during the two months was as follows:

	Aug.	Sept.
Stanislawow	3,860	3,900
Drohobycz	28,650	27,590
Jaslo	9,940	9,820

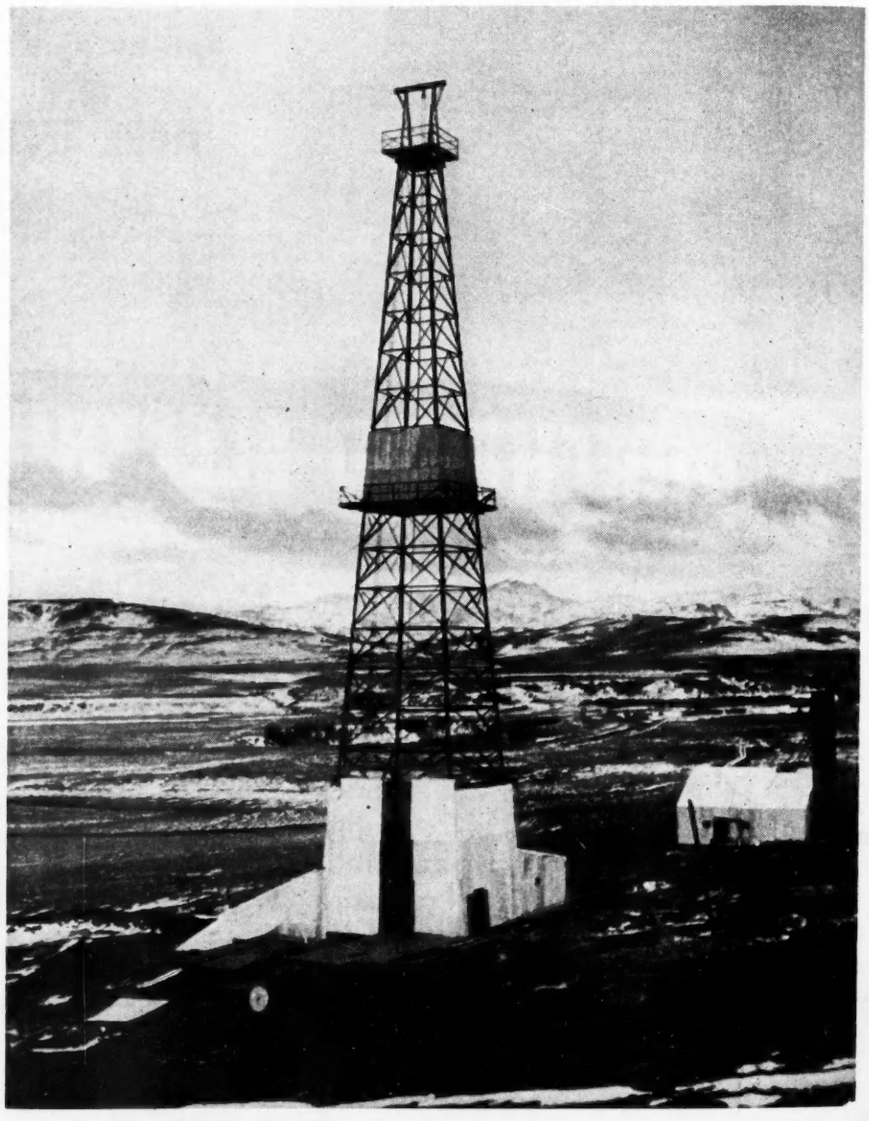
MEXICO

Completions

(NOVEMBER)

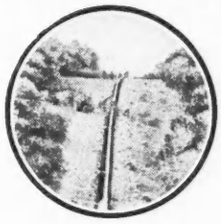
Company, Well and Location	Init. Prod. Bbls.	Depth
Gen. Admist. Nat. Pet. Petronac-Laredo 1, Nuevo Laredo, Tams...	¶3	1980
Gen. Admin. Nat. Pet. Rancherias 5, Camargo, Tams.	¶20	1930
Gen. Admin. Nat. Pet. Petromex 41, Rancho Abajo, Ver.	315	2685
Fidel C. Martinez, Lajitas 3, Mier Municipality, Tams.	¶3.7	2067
Mexican Sinclair Pet. Corp., Gonzales 15, Leobardo Gonzales Mun., Ver.	142	1708
Cia. de Inversiones Aztlan, S. A., Amatlan 11, Amatlan Mun. Ver...	*	2050

*Failures; †Junked; ¶Million cu. ft. gas.



Turner Valley drilling was slowed up last week by temperatures dropping to 28 below zero. This is Davies Petroleum Company's No. 1, one of the tests in the field using modern rotary equipment.

PIPE LINE NEWS



New East Texas outlet to Gulf Coast provided

Kilgore, Texas.—Equivalent of another trunk line outlet to the Gulf Coast for the East Texas field will be provided by Bell-General Transit Corporation, new concern formed by Pure Oil Company, General American Oil Company of Texas, McMurrey Pipe Line Company and Bell Oil & Gas Company. The latter three control the market for about 20,000 barrels of daily allowable in the field, and the bulk of this will be diverted to coastal markets. Bell-General Transit Corporation has acquired McMurrey Pipe Line Company's 8-inch trunk line, extending from Overton section of the field to Tyler, involving 19½ miles of pipe. This line was originally built in 1931 by Tyler Pipe Line Company. Pipe is en route from mill to build 21 miles of 8-inch line from the Tyler terminal to Bullard station, Smith County, where connection will be made with Pure Transportation Company's Van - Smiths Bluff 10-inch carrier. The new unit is slated to be completed by February 1, and will have a capacity of 20,000 barrels daily.

Pure Oil Company controls the stock of the Bell-General Transit Corporation, and will have three men on the board of directors while the other concerns are to be represented by one each. Officers follow: Albert Finston, Bell Oil & Gas Company, Tulsa, president; Marvin McMurrey, McMurrey Pipe Line Company, Tyler, and D. D. Irwin, Pure Oil Company, Chicago, vice-presidents; A. H. Meadows, General American Oil Company of Texas, Dallas, secretary; B. I. Lubell, Bell Oil & Gas Company, Tulsa, treasurer; and W. V. Keeley, Pure Oil Company, Chicago, assistant secretary-treasurer.

Pure Oil Company has been forced to steadily increase its purchases of East Texas crude to offset shrinkage in proration allowables of the Van field, obtaining deliveries through the American-Liberty Pipe Line Company's 8-inch line, which extends via Pure Transportation Company's Rusk station thence to Conroe field and Houston. During November, 296,500 barrels of East Texas crude was routed via Rusk station to Smiths Bluff, and movement of Van oil to the latter point dropped to 119,400 barrels for the month.

Propose natural gas line to serve Chattanooga

Piping of natural gas to Chattanooga, Tennessee, a project that involves an expenditure of $1,500,000 and construction of an 80-mile pipe line, came one step closer to reality when the Chattanooga board of city commissioners last week granted Chattanooga Gas Company a new 30-year franchise on condition that actual construction work on a natural gas system be underway in 18 months. The company, which several weeks ago announced that a proposal to bring in natural gas was under consideration, had requested a 40-year franchise to replace one which expires in 16 years. If construction work is not underway in 18 months, the old franchise again takes effect.

Officers of the company said natural gas would probably be obtained from Southern Natural Gas Company, whose lines extend as far as Rome, Georgia. It would, however, be necessary to go as far as Cedartown, Georgia, with a new line as Southern Natural's line to Rome would be inadequate.

Memphis wants lower natural gas rates

A request for information on a Tennessee Utilities Commission announcement of several months ago that it would demand monthly reports on operations of the Memphis Natural Gas Company, pipe line firm bringing gas from the Monroe gas fields of Louisiana to the Memphis Power & Light Company was made last week by the Memphis Department of Public Service as the Tennessee city launched a campaign for lower gas rates.

The state commission had announced that it would order the pipe line company to submit monthly reports, contending that the pipe line company came under state jurisdiction because it made changes in pipe line gas pressure within the state.

Labor

[*Continued from page 15*]

may maintain a 54-hour week, divided into six 9-hour days. The second ruling applies to "outside workers" and declares that "employers may permit employes in or immediately connected with outside work to average 44 hours per week over a period of one calendar month and to work six days per week where weather and climatic conditions have caused interruption of regular employment."

The new compensation act broadens the employers' liability for diseases and infections resulting from hurts and would greatly increase the cost of insurance. Other points raised by firms bringing the constitutional test are that the law would make employers liable for injuries received elsewhere than on their own property, that they would be liable for an injured employe not working in accordance with the law, that compensation would be alowed in excess of wages received by many workers and that the compensation board may say what the future earnings of the injured shall be. The act would increase the maximum benefits from $15 to $18 a week, and the minimum payments from $7 to $12. Employers would be required to bear the cost of administration of compensation.

Despite an informal ruling by Judge William M. Hargest, of Dauphin county court at Harrisburg, that persons cannot be prosecuted for violation of the 44-hour week law until its constitutionality has been determined by the high court, Bashore on January 3 proclaimed the law in effect and said "it certainly will be enforced." He announced that 25 investigators had been sent out of 7 district headquarters and that their first duty would be to investigate 500 anonymous tips of employers violating the law.

"We are administering and enforcing this law in a normal way the same as we enforce all other laws," Bashore said. "Of course, we are not arresting anyone the very minute a violation is found. The investigator warns the employer where he is doing wrong, sends the report to me and in two or three days files another report saying whether the employer conformed or failed to conform to the regulations."

A survey of many industries made last week revealed that the majority apparently were temporarily ignoring the work-week restrictions, while attorneys for many firms were advising their clients to await a decision of the highest tribunal before rearranging their work schedules.

Proration

[*Continued from page 14*]

ence of the saddle was insufficient. They contend that Penwell, Jordan and the Waddell-Henderson field, south of Jordan, are one continuous unit. Gulf representatives pointed out that this company is now drilling a well between Waddell-Henderson and Jordan in an effort to determine whether these fields are continuous, and asked that the Commission delay action on the application for setting a boundary line until this well has been completed, which they expected would be by January 15.

Under the proration plan in effect at Penwell, it is unprofitable to drill more than one well on 40 acres. Operators in the new field, however, apparently desire to space their wells closer. The statewide spacing rule, which allows wells to be drilled 150 feet from lease lines and 300 feet apart, or one well to two acres, is in effect in both fields.

Postpone at Schuler

On request of several operators, Arkansas Board of Conservation at a meeting January 3 postponed until February 7 a hearing scheduled January 10 to study rules and regulations, as well as allocations for wells in the Permian lime at Schuler.

The board last week put into effect rules and regulations for the newly-discovered Buckner field, Columbia County. The board defined the Buckner field as comprising

Township 16, Ranges 22 and 23 and extensions thereof, and stated that rules now promulgated apply to wells to the Permian lime.

Besides setting casing rules the board provided that allocation of production shall be on a 50-50 acreage and bottom-hole pressure basis. Previously a 40-acre spacing rule had been adopted for Buckner. The gas-oil ratio was set at not exceeding 2000 to 1.

The casing rules provide for 100 feet of surface pipe, a minimum of 1800 feet of second string and oil string must be set with enough cement to fill the space behind the pipe to within 5000 feet of the surface. Well-head connections must be able to withstand 4000 pounds pressure and blowout preventers must be used on the second string to withstand 4500 pounds.

Orders increasing allowables for two Gulf Coast fields effective January 5 were issued by the Texas Railroad Commission Friday. Thompson was raised from 8183 barrels to 12,236 barrels.

Manvel was raised 1625 barrels to 9500 barrels.

The commission has scheduled a hearing for January 18, at Austin, to consider revision of the field rules for the Hardin field, Liberty County. Special consideration will be given to spacing and casing rules.

Kansas Pipe Lines Prorate

Pipe line proration came to Kansas for the second time within the past 8 months with the announcement by Phillips Petroleum Company that its runs would be on the order of about 15,200 barrels per day, or only 80 percent of its allotment of 19,000 barrels as fixed by the state commission. The same holds true for pipe line takes of Stanolind Pipe Line Company, which will account for about 85 percent of the allowable. These runs are not actually a cut back in pipe line takes so much as they are a reflection of the increased state allowable of 186,300 barrels, 7000 barrels daily above the Bureau of Mines recommendation of 179,300 barrels.

E. B. Shawver, president of the newly organized Kansas Independent Oil & Gas Association, and others interested in the situation conferred in Tulsa with pipe line officials. Aiming toward increased pipe line runs proportional to the state allowable increase, the present situation in regard to Kansas, and the Mid-Continent marketing power as it relates to crude runs were discussed in detail.

Observers point out that the present might not be considered as an opportune time to raise allowables, even though it be justified by productivity. Demand has definitely dropped in some areas, and storage facilities at both farm and refinery are lacking or are below capacities sufficient to absorb increases. Pipe line capacities are operating at maximum in many areas of Kansas production and it is pointed out in addition that the present market does not justify expansion of carrying facilities as arteries already in existence can transport all the crude which the market can take.

Another interesting feature of the situation is the reference to Illinois flush production as being partially responsible for decreased market demands.

KANSAS FIELDS

Ellis County wildcat shows possibility of producing oil.

★ ★ ★

Whelan pool is extended a half-mile to the northwest.

Wichita.—For the first time in several weeks, Kansas ended a 7-day period without reporting a pool opener. Northwest of the Haller pool in Ellis County, however, one wildcat did give indications it might be opening another new producing area. A Barber County pool and the Stumps-K.C. area were extended and satisfactory progress was reported from numerous other areas.

Glimac Oil Company and Duwe & Farris' Richards 1, SE SW NW 4-11s-18w, northwest of the Haller pool of Ellis County and 4 miles southeast of the Zurich pool in Rooks County, had a saturated core from Kansas City lime. The formation was topped at 3250 feet and drilled to 3370 feet where casing was being run. The core came from between 3363 and 3370 feet.

James Davis' Williams 1, SEc NW 30-31s-11w, Whelan pool of Barber County, drilled to 4299 feet in Mississippi lime and on preliminary test flowed 100 barrels of 32 gravity oil in 20 minutes. It extends the pool one-half mile northwest.

Skelly Oil Company's Volkland 1-B, NW SW NW 5-18s-10w, extended the Stumps-K.C. area of Rice County one location south, and was completed for a potential of 4005 barrels of oil from Kansas City lime. It was the second potential for the well; on the first it made 3986 barrels of oil.

Continental Oil Company and Cities Service Oil Company have made location for a wildcat test at Trexler 1, CEL W/2 NE 15-9s-21w, 10 miles southeast of Hill City in Graham County, in the center of the central Kansas uplift.

Just west of the Sittner pool in Stafford County, Stanolind Oil & Gas Company's Walker 1, NEc SW 33-21s-12w, was reported filling with oil from Siliceous lime at 3625 feet after drilling plugs. It filled 1500 feet in a short time, and after standing several hours,

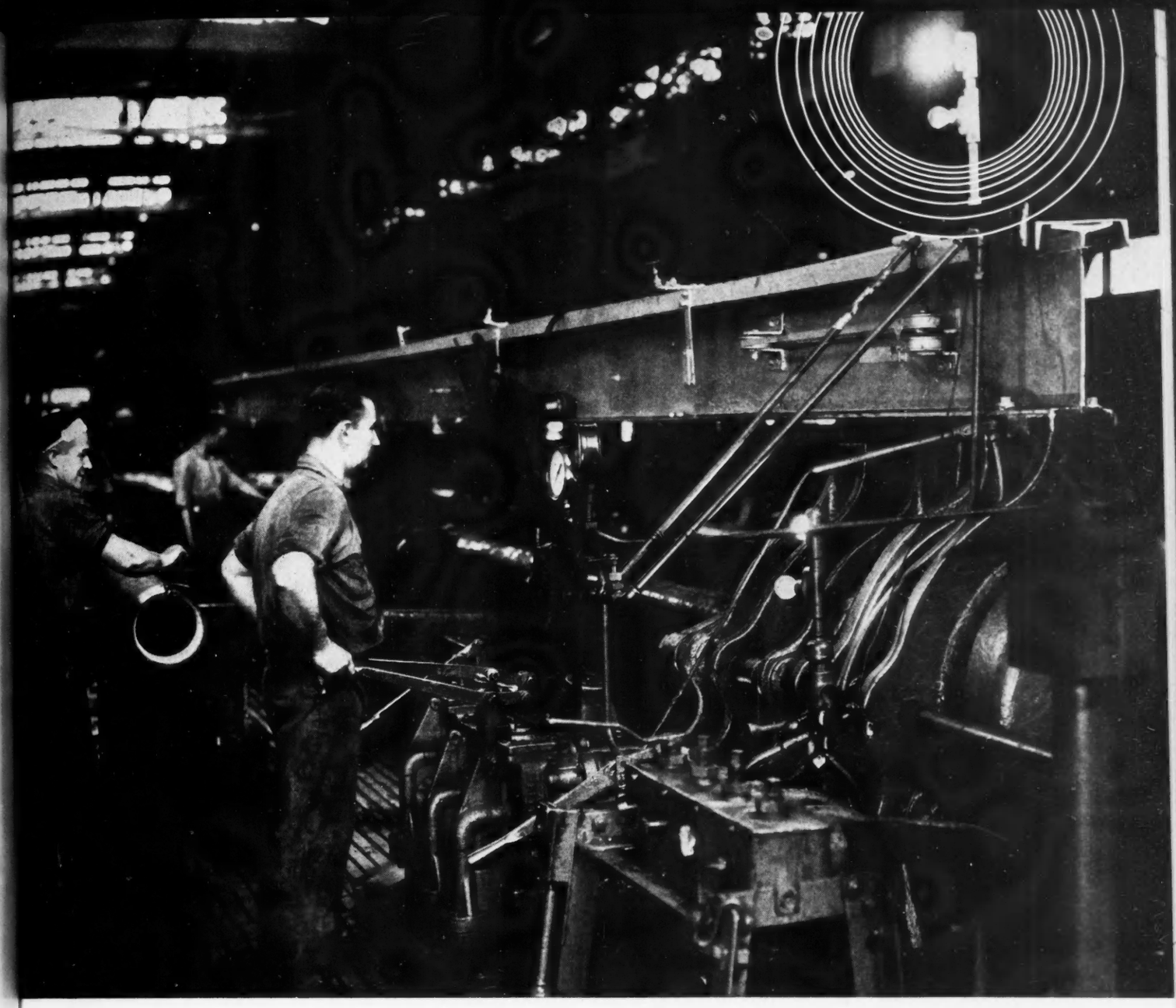
Index to Field Development News

Area	Page
Arkansas	79
California	66
Eastern States	85
Illinois	80
Kansas	62
Louisiana Coast	77
North Louisiana	79
Michigan	84
New Mexico	84
Oklahoma	64
Rocky Mountains	70
Southeastern States	80
East Texas	74
Texas Gulf Coast	76
North Texas	71
Panhandle Texas	74
Southwest Texas	75
West Texas	73
Wildcat Drilling Report	86

KANSAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BARTON COUNTY—		
Carter, D. Hogan 2, se sw nw 11-17s-11w	741	3365
Continental, M. E. Ford 1, sw sw nw 10-17s-13w	945	3349
Stanolind, Fred Panning, cw¼ nw 11-20s-11w	1576	3286
Lario & Atlantic, M. Meyer "B" 1, se ne sw 13-20s-11w	*	3333
ELLIS COUNTY—		
Wolf Creek, Dreling-Deal 1, ne ne sw 4-12s-17w (pb-3672)	488	3680
ELLSWORTH COUNTY—		
Magnolia, L. Andrea 5, sw sw sw sw 7-17s-10w	361	3087
Phillips, Patzner 6, ne sw sw 30-17s-10w	2865	3290
McPHERSON COUNTY—		
E. B. Shawver, Lively 3, se nw nw 29-19s-1w	174	3378
PAWNEE COUNTY—		
Mid-Continent, Bixby 1, nw nw nw 24-20s-16w	252	3821
Stanolind-Amerada, H. Jantz 1, sw sw sw 25-20s-16w (pb-3812)	*	3822
PRATT COUNTY—		
Pem. Drlg. Co. et al, Holland Est. 1, sw nw se 6-26s-12w	*	4240
RENO COUNTY—		
Wilcox O & G, Montford "A" 2-A, ne ne sw 12-23s-4w	1260	3270
RICE COUNTY—		
Continental, Anna Grott 4, ne nw sw 32-20s-7w	2978	3318
RUSSELL COUNTY—		
W. C. McBride, A. J. Jellison 1, ne ne sw 19-13s-14w	1158	3221
Cities Service, Rogg 2, nw se ne 27-14s-13w (pb-2925)	451	2982
Rogg 3, sw se ne 27-14s-13w (pb-2927)	2900	2970
W. I. Souther, Meharg 2, nw ne ne 18-15s-13w (pb-3030)	675	3247
Murfin & Fernon, Pearson 1, ne ne ne 31-15s-15w	*	3480
SEDGWICK COUNTY—		
Steinbuchel, Shaffer 1, sw sw nw 18-25s-1e	*	3685
STAFFORD COUNTY—		
Stanolind et al, U. G. Ferris 1, se se nw 23-24s-11w	2055	3805
Atlantic & Phillips, McNaghten 1-B, nw nw nw 27-24s-13w	1449	4091
WOODSON COUNTY—		
Harris et al, Weide 1, ne sw sw se 17-25s-1e	*	1560
Sheedy et al, Lee 6, nw sw ne 28-25s-14e	20	1460

*Failures; †Junked; ¶Million cu. ft. gas.



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YOUNGSTOWN

OIL COUNTRY TRADE MARK YOUNGSTOWN TUBULAR GOODS

filled more than 3300 feet. It is three quarters of a mile southwest of the Sittner pool.

West extension of the Gilchrist gas pool of Pratt County appeared definite last week at Skelly Oil Company et al's Lunt 1, CNW 18-28s-11w, which was making approximately 7,000,000 cubic feet of gas from Viola lime. Estimates place the well as a 43,000,000-cubic foot producer when completed. It was at a plug-back total depth of 4202 feet.

Turner Pool South End Reached

Apparently defining the south end of the Turner pool of Cowley County, Deep Rock Oil Corporation's Cranston 3, NW SW NE 30-32s-6e, drilled to 3015 feet in Mississippi lime and abandoned. Both Layton and Bartlesville sands were missing in the test.

What looks to be the largest producer in the Wellington pool of Sumner County is E. B. Shawver et al's Barlow 3-B, CWL SW SE 33-31s-1w, 2 miles northwest of Wellington, which made an estimated flow of 5000 barrels of oil through a partly opened control head. It made 512 barrels in 4 hours, and is the sixth producer on the lease.

A good producer was reported on the way for the Zenith pool of Stafford County at Stanolind Oil & Gas Company's Volker 1, SW NW NE 23-24s-11w, which made one flow over the rig after finding top of the lime at 3802 feet. Operators were coming out of the hole with tools preparatory to running tubing for production test. It flowed 94 barrels of oil the first hour.

In the south extension of the Chindberg pool of McPherson County, Pryor & Lockhart's Bixby 1, NEc SW 24-19s-3w, was being completed, from 3015 feet in chat, making 120 barrels of oil the first 4 hours of an 8-hour test. Figures for the last 4 hours were not available.

In the South Trapp pool, Shell Petroleum Corporation completed Stettinger 1, NE NW SE 1-16s-14w, for 2472 barrels of oil. Production was from Siliceous lime at 3370 feet.

A half-mile south of production in the Drach pool of Stafford County, Stanolind Oil & Gas Company's Mettscher 1, NEc NW 13-22s-13w, was coring below 3450 feet in Kansas City lime. Top of the formation was at 3335 feet.

North offset to the discovery producer, Stanolind Oil & Gas Company's Schilling 1, SEc NW 12-22s-13w, was preparing to take a swabbing test before acidizing. Siliceous lime was shot at 3716 feet, following which it filled 400 feet with oil.

Tulsa.—Of the 30 completions for Oklahoma last week, 20 were for oil with an initial production of 1509 barrels of oil. Three gas wells produced 8,680,000 cubic feet of gas and there were 7 dry holes. There were 21 first reports, Pottawatomie County leading with 4. There were 2 each for Osage, Pontotoc, Pawnee and Tillman counties, and 1 each for Caddo, Carter, Creek, Jefferson, Okfuskee, Okmulgee, Oklahoma, Payne and Stephens.

Pawnee, Okla.—Sealed bids on 21 tracts of Indian lands in Kay and Pawnee counties will be received here January 27, according to an announcement by Lem A. Towers, superintendent of the Pawnee Indian Agency. A total of 1461.66 acres is being offered.

OKLAHOMA FIELDS

Payne County pool opener estimated 10,000 bbls. initial.

★ ★ ★

Atoka County wildcat given chance despite salt water.

Tulsa. — Supporting numerous forecasts that 1938 would be a good year for Oklahoma, a new pool was opened January 2, in Payne County, 7 miles southwest of Stillwater. Other parts of the state were extremely quiet. A closely watched wildcat in Atoka County was drilling with salt water in the hole.

Mid-Continent Petroleum Corporation et al's Ramsey 1, SWc NW 18-18n-2e, on a community block is producing from what is tentatively identified as second Wilcox sand at 4796 feet. The well was bailed down 500 feet and began flowing, making 935 barrels of oil the first 2 hours, and estimated good for 10,000 barrels daily. Gravity was 43.4 degrees, corrected.

Top of the sand was had at 4768 feet. When bailed in it made 30 barrels the first 6 minutes; 73 barrels in 10 minutes; 250 barrels the following 10 minutes, and at the end of the first hour made 450 barrels. It flowed 475 barrels the second hour. Operators evidently had not expected such a large well and had set only two 500-barrel tanks. Later in the week, Oklahoma Pipe Line Company began laying 1½ miles of 4-inch line to take the oil to its main line serving Oklahoma City, Edmond and the Cushing districts.

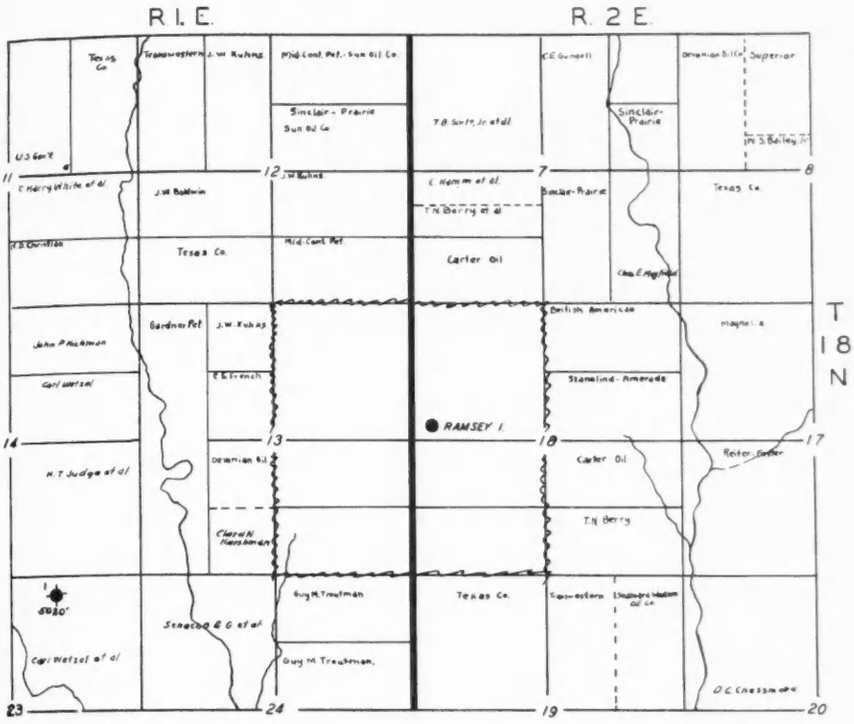
Ramsey 1 is located on a 640-acre community block. Mid-Continent has ¾ interest; Carter Oil Company ⅛ and Transwestern Oil Company and Sinclair Prairie Oil Company 1/16 each. Reports from the area state Transwestern Oil Company has bought more than $300,000 worth of royalty in the area.

The well was running very even before production was found, having missed the Mississippi formation entirely. At 4796 feet, it is not definitely known whether the well is in first or second Wilcox, only 28 feet of formation having been penetrated. Other companies holding acreage outside the block are watching developments before staking locations for new tests.

A dry hole was drilled by Gardner Petroleum Corporation and Twin State Oil Company at NE NW SE 23-18n-1e, several years ago. The test was carried to 5020 feet.

In the Boggy Depot area of Atoka County, Gilmort Oil Corporation's Lee 1, NE NW SW 2-4s-10e, was drilling below 2052 feet with 1600 feet of salt water in the hole. Some hope was held out for the well as it had had a small show of oil at 2032 to 2034 feet after

These men brought in Oklahoma's "1938 Baby," Mid-Continent Petroleum Corporation et al's Ramsey 1, in Payne County, 10,000-barrel producer which opened the first pool of the new year. They are, left to right: H. B. Ward, J. M. Rains, P. W. Corley and Lester Brown.



Drilled on a community block, Mid-Continent Petroleum Corporation et al's Ramsey 1, SWc NW 18-18n-2e, opened Oklahoma's first pool for 1938, made 43.4 gravity oil from what is thought to be second Wilcox sand at 4795 feet. Mid-Continent Petroleum Corporation holds a three-quarters interest in the block; Carter Oil Company one-eighth; Transwestern Oil Company and Sinclair Prairie Oil Company one-sixteenth each. Area outlined by wavey line represents community area.

finding top of the Bromide at 1604 feet. It is just west of the town of Caney.

Jesse Pool Gasser

Continental Oil Company completed Smith 1, NW SW SW 2-1n-7e, in the Jesse pool, Pontotoc County, as a gasser. Drilled to 4131 feet in Sylvan shale, the well swabbed 7 barrels of oil, net, after acidizing the Hunton lime at 3994 feet. Plugged back to 3212 feet, casing was perforated between 3015 and 3046 feet and was shut in after making 2,700,000 cubic feet of gas.

Another good producer was reported from the Statler lease of Mid-Continent Petroleum Corporation in Jesse. Statler 10, NW SE SW 2-1n-7e, drilled to 4519 feet in Bromide and flowed 157 barrels of oil in 2 hours and 15 minutes with drill pipe in the hole. Tubing was being run. Statler 11, NE SW SW 2-1n-7e, was drilling below 4282 feet in Viola lime, topped at 4160 feet, and Statler 12, C N½ N½ SW 2-1n-7e, was drilling below 810 feet.

Ardmore

In southern Oklahoma, center of interest continues to be the Milroy-Fox deep area, where Gulf Oil Corporation was testing Smith 1, CSW SW 26-2s-3w. This well had top of the oolitic lime at 7680 feet and drilled to 7773 feet. A ½-inch bottom-hole choke was inserted, ⅛ open. On January 3 the well flowed 260 barrels of oil in 20 hours and the following day made 374 barrels in 23 hours with 6,000,000 cubic feet of gas. Casing pressure was gauged at 2600 pounds and tubing pressure at 1800 pounds. The well has not been acidized.

Gulf Oil Corporation's Johnson 1, CSW NW 27-2s-3w, has not made such good headway, but continued testing. It had top of the oolitic at 7845 feet and at 7909 feet was washed in with no results. It was then acidized with 2000 and 6000 gallons, with no results. Drilled deeper to 7970 feet, it again was acidized, first with 3000 gallons, which had no effect, and later with 10,000 gallons. Following the last acid treatment, the well flowed 72 barrels of oil net the first 6 hours, making an estimated 12 barrels of oil per hour. Another 10,000-gallon treatment induced production of 618 barrels in three days, the oil testing 41 degrees. Gas was gauged at 1,200,000 cubic feet.

Carter Oil Company's Carter-Harley 1, CNW NW 19-2s-3w, was drilling below 5721 feet in green shale. It had top of the Hunton lime at 4920 feet, and cores in the top and bottom of the formation showed oil and gas. After topping Sylvan shale at 5475 feet, a drill-stem test was taken with packer set at 5445 feet. Opened 20 minutes, the test recovered 59 joints of mud and 6 joints of gas with the bottom 2 joints showing oil and gas.

Two gassers were reported for the Cement area of Caddo County. Magnolia Petroleum Company's Sames 6, CSE SE NE 35-6n-10w, was making 47,000,000 cubic feet of gas from 4478 feet, total depth was 5313 feet. Ray Stephens Griffin 2, SE SW NW was making 8,000,000 cubic feet of gas and about 500 barrels of oil from 4346 to 4376 feet.

In southeastern Grady County, Gulf Oil Corporation's Thomas 1, SW NW NW 14-4n-5w, was drilling below 9675 feet in sand and shale. It is the deepest drilling well in the state. Coline Oil Company's Johnson 1, SW SE NE 1-2n-8w, northwest of Marlow in Stephens County, which originally drilled to 10,001 feet, then plugged back, was drilling outside the 7-inch casing at 8687 feet. The casing collapsed at 8689 feet several weeks ago.

Oklahoma City Sector

The Oklahoma City district was the quietest in several weeks at the start of the new year. In the Langston pool of Logan County, Ohio Oil Company's Knight 1, SE NE SW 12-17n-1w, was making around 26 barrels of oil per hour and 2,600,000 cubic feet of gas. It was at 5075 feet in soft sand, topped at 5070 feet.

In the Lamont pool of Grant County, Carter Oil Company et al's Booher 1, CWL NW SW 16-25n-3w, was picking up drill pipe preparatory to drilling plugs. Seven-inch casing was set at 5421 feet. The same interests' Barclay 1, CEL SE NE 17-25n-3w, was drilling below 4923 feet in shale.

OKLAHOMA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARTER COUNTY—		
Chas. Clowe et al, Heffner 1 nw se sw 4-1s-3w	3.68	2492
Magnolia, E. T. Richards 77 se -e sw 31-3s-3w (pb-1147)	27	1157
KOT Oil Co., Ramsey 1, sw sw ne 36-4s-2w (otd-2354)	30	2354
CREEK COUNTY—		
Phillips, B. Berry 1, sw sw sw ne 22-17n-10e	*	2515
Kissler et al, Franklin 1-A, ne ne ne 29-18n-9e	12	2950
HUGHES COUNTY—		
C. E. Davis, Williams 1-A, ne se se 36-9n-8e (pb-4265)	*	4349
JEFFERSON COUNTY—		
Bridwell-Continental, W. D. Seay "A" 11, nw ne nw ne 10-7s-5w	46	1084
W. D. Seay "A" 13, nw nw nw ne 10-7s-5w	10	1109
LINCOLN COUNTY—		
Helmerich & Payne, Fitch 2, se sw ne 15-14n-6e	40	3011
MUSKOGEE COUNTY—		
C. Garrett, Johnson 1, ne ne ne sw 13-13n-15e	*	2100
Robinson, Brown 5, sw sw se se 18-13n-16e	32	2156
OKLAHOMA COUNTY—		
Big Chief Oil Co., Park Place 2, nw se se ne 35-12n-3w	925	6400
OKMULGEE COUNTY—		
Penrod, Doyle 3A, ne ne nw sw 15-13n-14e	15	1770
Misener, Colbert 6, nw se sw 14-14n-14e (pb-1760)	2	1763
Okla. Oil Corp., Bruner 1, ne ne se se 6-15n-14e	*	1847
OSAGE COUNTY—		
Midco Oil Corp. 27, nw se nw se 18-22n-10e	10	2018
Peters & Norbla 3, nw nw ne 33-22n-11e	12	1743
I.T.I.O. 393, ne se se 29-23n-9e	2	1757
PONTOTOC COUNTY—		
Campbell, Scrwner 1, sw se sw 15-2n-7e	*	1473
Blackstock, Moody 1-B, ne ne se 27-2n-7e	111	1460
Magnolia, Hardin 5, se nw ne 30-2n-7e (pb-1320)	*	3800
POTTAWATOMIE COUNTY—		
Prod. Inc., Cardwell 5, ne sw nw 15-7n-4e	20	3968
Indian States, Hickey 1, se se ne 31-11n-4e	25	4453
SEMINOLE COUNTY—		
Gulf, S. Petter 3, sw se ne 23-5n-7e	112	4262
Westheimer & Neustadt, Factor 2, cn½ ne sw sw 25-5n-7e	¶3	2250
Sinclair Prairie, Wilson 1, se sw sw 8-9n-6e (pb-2795)	*	4375
Carter, Lukes 3, nw ne ne 27-9n-6e	10	4198
Merva, Johnson 3-A, se nw ne 10-10n-8e (pb-3910)	60	4166
STEPHENS COUNTY—		
Karl Kiester, Sid Jones 1-B, se se sw se 23-1s-5w	6	620
TULSA COUNTY—		
Johnson O & R Co., Brazwell 2, sw se sw sw 31-19n-10e	4	2293

*Failures; †Junked; ¶Million cu. ft. gas.

Montebello well flow will revive that field's activity.

★ ★ ★

East edge at Ventura Avenue gets good flowing producer.

Los Angeles.—Completion of a well good for 1400 barrels of 38-gravity oil on the western edge of the Montebello field in Los Angeles County, production coming from the Miocene formation, probably means renewed activity in this old field in 1938.

St. Helens Petroleum Company's Monterey 20, located near intersection of Montebello Boulevard and Lincoln Avenue, west end of the field, with bottom at 6353 feet (8⅝ inch cemented at 6221 feet), was placed on production January 2 for 2000 barrels of fluid, cutting close to 50 percent water, but by January 3 it had cleared up to 1400 barrels of 38-gravity oil, cutting only 2 percent. Flow is through ⅞-inch choke, with 600 pounds on the tubing and 1350 pounds on the casing. The flow is accompanied by 9,000,000 cubic feet of gas.

This new well at Montebello can be listed as the first producer to tap the Miocene at Montebello, and apparently the east and west sides of the Montebello field are separated by a cross fault which makes conditions different in the two portions of the field. This is the first real test of the Miocene formation in the field, and it is considered equal to the Clark Zone, which was very productive at Santa Fe Springs.

In practically every other domal field in Los Angeles Basin, the Miocene Zone has been proven for 1000 to 1500 feet in thickness, and in former drilling it had been thought maybe Montebello was the only exception. The new well apparently proves this field is no exception. It is very probable the new well has only tapped the Miocene Zone, and other wells may be drilled deeper for a larger and more lasting production. Further drilling will be necessary to prove the exact conditions.

East Edge Producer at Ventura Avenue

Tide Water Associated Oil Company's V. L. & W. Co. 32 at Ventura Avenue has been completed for 1590 barrels of 26 gravity oil and 1,950,000 cubic feet of gas, being the best completion for the field in several months. Bottom is at 7210 feet and 8⅝-inch was cemented at 6658 feet. The flow is through 520 feet of perforated 6⅝-inch liner landed on top of cement plug at 7210 feet. This is the most easterly well in the field and represents an extension of about 500 feet.

In the Harbor district of the Wilmington field, General Petroleum Corporation's Harbor 6, located at Alpine and Sonoma Streets, encountered the top of the Terminal zone at 2880 feet, about 200 feet higher than in the older Wilmington area. The well is now coring at about 3000 feet. The developments in this hole indicate that new wells to be completed in the new area will be up to the best of expectations. Three key wells are now being drilled in the new area. Large casing, 10¾-inch or more, is being cemented at 2500 feet and deeper, permitting much deeper drilling if it is thought desirable. Many other locations have been made in the new area, but other operators are waiting on results of the three key wells now drilling.

During the early part of the year, it appears that Richfield Oil Corporation will be the most active operator in the field. The company has 6 leases and is drilling 2 holes and has staked 30 other locations. Of course, all of the locations will not be drilled at once. Superior Oil Company is drilling 1 hole, but has 5 rigs up and has made 9 locations.

Union Pacific Railway Company, the most active operator in the field during the past few months, is drilling 5 wells and has 6 rigs up. It is expected this company can complete its drilling campaign in the next few weeks. Most of its wells have been offsets, since its leases have been on narrow strips bordering street car lines serving outlying districts and railway lines serving the greater harbor district of Los Angeles, Long Beach and San Pedro.

CALIFORNIA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
FRUITVALE—		
Western Gulf, Red R. 7	580	3540
KERN FRONT—		
Standard, No. 27	75	2230
MOUNT POSO—		
Shell, Security 22	130	1730
PREMIER—		
Pebble Beach Oil Co., Newhope 6	100	2653
ROUND MOUNTAIN—		
California Western Oil Co., Kernco 4	300	1929
RIO VISTA—		
Tracy Drilling Co., Hanson 2	¶40	4380
SANTA MARIA VALLEY—		
A. D. Mitchell, Wilson 2	2000	4610
MOUNTAIN VIEW—		
Section Six Oil Co., Johnston 1	*	7584
SAN LUIS OBISPO COUNTY—		
Little Cuyama Oil Co., No. 1	*	3950
WILMINGTON—		
Union Pacific, Offset 61	195	3475
Offset 62	200	3455
U. P. 74	170	3340
Offset 77	30	3195
Offset 52	200	3480
Offset 53	320	3343
DOMINGUEZ—		
Union Carson 10	205	7636
EL SEGUNDO—		
Ohio, Gough 10	715	7359

*Failures; †Junked; ¶Million cu. ft. gas.

Pennsylvania investigators get into high gear

Pennsylvania's oil investigating commission swung into high gear last week and took steps to determine the production and distribution figures of every company doing business in the state, the financial relationships and corporate structure of every company, their sales and advertising methods, and prices charged in every municipality of the state. By a series of questionnaires, the committee will determine just about everything there is to know about Pennsylvania's petroleum industry, from the location of every service station, pipe line, oil well and refinery to the ownership and operating practices of them.

The commission was created by the 1937 legislature to determine whether the industry should be subjected to state regulation. Numerous hearings on production, refining and marketing problems have already been held, but last week's developments indicated the five-man body had barely started its work. Fortified by a $50,000 appropriation obtained by a $1 levy on every gasoline pump in the state, the commission has the power of subpoena and has engaged petroleum and statistical experts to aid in its work.

Judge Ralph Smith, of Pittsburgh, chairman of the commission, revealed that subpoenas were issued last week to approximately 50 pipe line and refining companies ordering them to submit detailed information on their corporate structure. Presidents of the companies will be required to present the information at a hearing of the commission to be held February 1 in Philadelphia, and each copy of the information forms must be certified, and signed and sealed by the secretaries of the corporations. Other questionnaries were sent to more than 5100 crude producers and more than 28,500 service stations and jobbers.

Smith said the questions asked are direct and matter of fact, that the commission tried to avoid "any questions of opinion or political controversy." The questionnaires seek information about the industry's advertising and publicity methods, the names of "industrial-commercial research" associations affiliated with each company, the names of research laboratories or foundations, labor organizations and societies of whatever nature supported wholly or in part by the oil companies, detailed figures on production costs of every product produced, manufactured or distributed by the industry, the cost of gasoline and oil products per barrel, per producing unit, per oil pool, per company, so broken down so as to reveal fraction of a cent comparisons within the industry.

Geology of Ten Section Field Is Interesting

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and
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THE Ten Section field is located approximately 10 miles southwest of Bakersfield, Kern County, California.

The field is situated on the very gently rolling floor of the San Joaquin Valley. There is no surface evidence of the existence of the Ten Section structure, which subsurface exploration has shown to be a gently folded, anticlinal dome.

Regionally, this field occurs as a fold in the deeper beds of the valley floor. It is situated on the easterly slope of the valley syncline, its position with relation to the axis of this syncline not having been accurately determined.

The field was discovered by Shell Oil Company with Stevens A-1, which was started in January and completed on June 2, 1936, at 7888 feet. The location for this well was chosen as a result of geophysical prospecting. which had indicated a subsurface high.

As a result of the discovery in Stevens A-1, a second well was drilled which penetrated 1188 feet of the so-called Stevens zone, which is the producing formation in this field. This second well, KCL A 6-29, was drilled to 8984 feet and found the upper 614 feet of the Stevens zone to be oil and gas bearing. Since the completion of this well five additional wells have been drilled, resulting in a total of seven producers in the field.

Shell is now engaged in drilling two more wells, and it is anticipated that two or more strings of tools will be kept in operation until development has been completed.

After the completion of the discovery well, an outpost prospect well was started by Ohio Oil Company, and two by Standard Oil Company. These were located approximately 1¼ miles to the north and 2 miles to the east of the discovery well. All three of these were unproductive after having penetrated from 525 feet to 740 feet of the Stevens zone.

Stratigraphy

Immediately beneath the surface alluvium there are approximately 900 feet of loosely consolidated fresh water, sands and gravels interspersed with occasional thin layers of clays and sandy silts. These beds probably represent either the Tulare formation or the Kern River series of the upper Pliocene. Below them there occurs approximately 6000 feet of Pliocene deposits which have not been classified. These beds may possibly be equivalent to the Etchegoin formation. This portion of the section occurs as a monotonous series of alternating claystones, siltstones and sands which are apparently of fresh water, brackish and marine origin. Ditch samples and occasional cores from various wells have yielded sufficient shell remains to lead to the conclusion that the Mulinia zone occurs at depths ranging between 3930 feet and 4050 feet.

The uppermost portion of the Miocene is represented by the so-called brown shale. This member is 915 feet in thickness.

The Stevens zone, from which production is obtained in this field, is also of upper Miocene age and lies directly beneath the brown shale. The Stevens zone has not been correlated definitely with any of the established Miocene formations in this area. For this reason it has been separately named (Stevens sand). However, it may possibly be equivalent to the Fruitvale sand, or the Fruitvale sand plus some portion of the deeper Fruitvale shale.

The second well drilled in this field, KCL A 6-29, which penetrated, as mentioned above, 1188 feet of Stevens formation, is the deepest well stratigraphically which has been drilled. At its total depth of 8984 feet, the well was still in the Stevens zone, the total thickness of which has not been estimated.

Lithology

The Pliocene, or Pleistocene and Pliocene layers which form approximately the top 6900 feet of the section in this area, are practically entirely composed of an alternating series of soft to firm claystones, siltstones, and loose to slightly consolidated, poorly cemented, easily friable sands. The uppermost beds of the Miocene, that is the brown shale, are composed of a series of dense, well indurated, generally well laminated, platy, dark brown shales. This member is characterized by numerous to abundant micro-organisms, pyritized diatoms, and resinous fish remains; and, occasional thinly bedded, dark brown chert streaks. So far as evidence from intermittent coring through this member has indicated, the Brown Shale is a uniformly deposited, evenly bedded formation.

The Stevens zone is made up of a series of sand beds separated by occasional shale streaks. The latter vary in thickness from 10 feet to in excess of 100 feet while the interbedded sand members vary in thickness from 10 feet to 160 feet. There is a noticeable irregularity in the thickness of the various sand and shale members comprising the Stevens zone. This lack of uniform thickness is believed to be due to irregularity in depositional conditions. This belief is substantiated by common cross-bedding and irregular bedding in the sand members themselves, and in the shales.

In general, the sands of the Stevens zone are moderately to fairly well cemented, compact, poorly to well sorted, medium grained to slightly coarse in texture, and generally free from fines. Associated with the sand bodies are occasional well cemented, impervious, sandstone shells, which, by their lack of correlation and by their general appearance, are considered to be lenticular or concretionary in nature. The average porosity of the sands comprising the productive horizons is 16 percent, the range varying from 12 percent to 20 percent. Insufficient data have been obtained to furnish a reliable index as to the permeability of these beds.

Structure

The structure is that of a gently folded, elongated anticlinal dome having an axial strike of approximately North 60 degrees West. Maximum dip of the beds so far penetrated on the southwest flank has been approximately 10 degrees. The northeasterly flank of the structure appears to be less steep with maximum dips approaching 7 degrees. From data so far at hand the positions of the synclinal axes on either side of the structure have not

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been determined. Along its longitudinal axis the structure has a more gentle dip than on either flank, the dip of both plunges being approximately the same, namely, 5 degrees at a depth of 7700 feet below sea level. There is a structural break which undoubtedly occurs as a fault. This fault drops the southeast nose of the structure approximately 200 feet with reference to the northwest portion. The nature and exact position of this break is as yet undetermined. Only one well (A 58-29) has been drilled on the southeast side of this break and additional drilling will be required to provide information in this respect.

The maximum closure in the block southeast of the fault is approximately 200 feet. Sufficient drilling has not yet been done to determine the maximum closure in the northwest block, but from the data obtained from the wells in the productive portions of the field and the outpost wells of Ohio and Standard it appears that closure in this block will be in excess of 500 feet.

Oil and Gas Accumulation

The oil and gas accumulations in this field, insofar as the beds penetrated to date are concerned, are confined to the upper 600 feet of the Stevens zone at the crest of the structure. These accumulations are apparently controlled entirely by the overlying impervious shale beds and the underlying bottom and edgewater.

While the productivity of the Stevens zone has been demonstrated on either side of the fault, it cannot be said whether this fault has influenced the accumulation of oil and gas. However, since only one well has been drilled in the block southeast of the fault, and since no subdivisions in the Stevens zone have been made in this block, subsequent remarks concerning the nature and extent of the oil and gas accumulations must necessarily be confined to that portion of the field northwest of the fault.

Five separate sand intervals have been found to be oil bearing. The uppermost of these is approximately 140 feet thick at the crest of the structure and contains a gas cap of rather broad extent, the entire vertical section of this body at the structure's crest being gas bearing. This sand was penetrated 56 feet by the discovery well, Stevens A-1. At this point the well produced at a maximum rate of 858 barrels of oil daily, gravity 60.4 degrees A.P.I. and 13,656 m.c.f. of gas per day. Coring and production tests of this uppermost body made in this and subsequent wells have indicated that at the crest of the structure the space occupied by gas in Sand 1 extends to the base of this zone, and that the gas-oil contact is approximately horizontal. Below the gas-oil contact in this and lower zones there exists a dark oil having an average gravity of approximately 35 deprees A.P.I. The extent of the oil accumulation in Sand 1 has not been determined and the limits shown on the accompanying plates are arbitrary.

Sand 2 is separated from Sand 1 by an intervening shale member approximately 30 feet thick. This sand is approximately 100 feet thick and contains a gas cap. The oil-gas contact is nearly horizontal and at the crest of the structure the contact occurs at the midpoint of the sand body.

Sand 3 is separated from Sand 2 by an intermediate shale member approximately 25 feet thick. Sand 3 is the thickest single sand body which occurs in the productive series, and at the crest of the structure it is 160 feet thick. The gas cap in this sand is comparatively small, its horizontal extent being unknown. However, production history of the several wells exploiting this sand shows that there is only a local gas accumulation at the structural culmination. One of the more pronounced variations in irregular deposition in the Ten Section field is apparent in Sand 3 by the manner in which this member decreases in thickness between KCL A 6-29, A-1 and KCL A 34-29.

Sand 4 with the characteristic irregularity noted for Sand 3, varies considerably in thickness from KCL A 78-30 to KCL A 34-29. This sand has never been separately tested. It was excluded from production in KCL A 6-29. In KCL A 34-29, in which its thickness is not more than 10 feet, it was tested simultaneously with the upper portion of Sand 5 which was demonstrated to be water bearing. Although the water location test which disclosed the latter information did not evidence any water in Sand 4, it can not be said conclusively that the sand is not water bearing at that location. However, inspection of the cores and the electrical log revealed that Sand 4 in KCL A 78-30 was undoubtedly water bearing. Thus such oil or gas as may exist in this sand will be confined to a limited area on the crest of the structure.

Sand 5 was first penetrated and opened to production in KCL A 6-29. Approximately 80 feet of this zone was found to be oil bearing, and after plugging lower water bearing sands, 70 feet of this zone was tested. This interval produced 1535 barrels daily clean oil, gravity 34.3 degrees A.P.I., and 1541 m.c.f. gas. From this evidence, water location tests in KCL A 34-29 mentioned above, and from the log of KCL A 78-30 it is apparent that the oil accumulation in Sand 5 has a very limited extent and is controlled by a horizontal water table which prevails in this interval.

Correlation Methods

Two principal methods have been used in this field for the purpose of making subsurface correlations. These are:

(1) Lithologic
(2) Electrical logging

Lithologic correlations are made from the continuously cored sections which have been obtained in the Stevens zone from all wells drilled into this zone. Correlations made by this method have proved to be reliable and are, in general readily made. Persistent lithologic changes which occur within the productive horizon assist in identifying the principal divisions that have been made in the Stevens zone.

Lithologic correlation above the top of the Stevens zone has not been necessary for development purposes. Since coring above this zone has been confined to a relatively small number of intermittent cores, for the purpose of inspecting intervals which appeared as possibly oil bearing from the electrical logs, no detailed lithologic correlations in this portion of the section have been made. However, experience has shown that one correlation point can be accurately determined by change in drilling. This is the top of the Brown Shale.

The lithologic correlations in all cases have been augmented and substantiated by correlation of electrical logs. It is the practice to record a complete log below the shoe of the surface water string. These logs are sufficiently uniform from well to well in general characteristics that convincing and apparently reliable correlations are readily made throughout the entire section. In the Stevens zone where detailed correlations have been made, it has been noted that the characteristic variations between the alternating sands and shales are repeated in each well to a considerable degree of uniformity.

In addition to the two above described methods, micro-paleontological correlation has been used to a limited degree for the purpose of identifying and verifying particular stratigraphic horizons, the principle of which has been the top of the Miocene. Ditch samples have generally sufficed for this purpose.

Development Procedure

Since discovery, the practice has been to locate wells in such a manner as to determine as early as possible both the vertical and horizontal limits of the oil and gas accumulation; and, to determine the general outline of the subsurface structure. This objective is being attained by the practice of locating wells along two lines which approximate the position of the longitudinal and transverse axes. These two lines have resulted in the formation of a generalized conception of the subsurface structure. This conception will be augmented as to detail by the drilling of additional transverse sections; the second of these is being drilled in the northwest portion of the field. Thus, the form of the structure as it plunges from the crest, and the extent of the oil and gas accumulations in these directions, will be determined. This detailed delineation of the subsurface both down flank and along the plunges is considerably necessary in view of experience in other fields which has shown that the accumulation down plunge is sometimes more extensive than the limits of accumulation along the generally steeper flanks opposite the crest, would indicate.

It was the practice when drilling the first wells to core through the oil bearing formations into the underlying water flooded sands for the purpose of determining the vertical limit of the oil accumulation. In these early wells the determination of the fluid content of the sands was made by drill stem and/or production tests. As experience was gained from these tests, it became possible to judge the fluid content of the sands solely by inspection of the cores. Thus, the present practice of determining the vertical limits of accumulation is confined to core inspection alone. Drill stem or production tests are made only in exceptional cases.

All wells in the Ten Section field have been drilled with steam operated, conventional rotary drilling equipment and the customary 136-foot steel derricks. Four 100-horsepower, 250 pounds per square inch working pressure boil-

ers are provided to furnish steam for the various engines and pumps. Slush pumps with both 15½-inch x 20-inch and 14½-inch x 20-inch steam ends have been used without noticeably different effect on drilling progress. Drag bits are used for drilling all formations except the brown shale which requires the use of rock bits. Coring is generally undertaken with wire line core barrels.

Wells are now drilled in about two months as compared to six months required for the drilling of the discovery well.

The derricks and all surface equipment, except the well head connections, are removed upon completion of the wells and utilized in the drilling of subsequent wells. As might be expected, considerable experimental effort has been required to determine a reasonably satisfactory drilling procedure. However, insofar as casing programs and hole size are concerned, simple standards have been already established as a result of having determined in early wells the conditions of oil and gas accumulation.

Two standard casing programs are employed. The first of these provides an extra string of casing cemented so as to exclude the gas bearing horizons from production. This program is followed in locations where one or more of the several gas caps are to be encountered. The second program is employed in the structurally lower locations where gas cap conditions are not encountered. It simply provides for cementing a single water string above the main oil horizon, and hanging a liner in the zone to be opened for production. Inasmuch as exploration and development drilling is being carried on down-flank from the gas cap, this second program is being employed exclusively.

With the latter program it is the practice to set 40 feet of 16-inch stovepipe casing as a conductor. Thereafter 14¾-inch hole is drilled with 6⅝-inch drill pipe to a depth of approximately 1000 feet, and 10¾-inch slipjoint casing is cemented to shut off surface waters. Through this casing a 9⅝-inch hole is drilled with 5-9/16-inch drill pipe to the top of the Stevens zone. The hole is then reduced to 7⅝ inches and is continuously cored to the final depth of the well. The 5-9/16-inch drill pipe used to drill the 9⅝-inch hole is used in conjunction with 4½-inch drill pipe for the drilling of the 7⅝-inch hole. A 7-inch casing is cemented above the oil zone with sufficient cement to fill behind the casing for 1000 feet or more. A 4¾-inch aluminum liner, perforated with 100 mesh slots, is hung opposite the horizon to be produced. Aluminum liners are employed because the rate of encroachment of edgewater in the several sands being exploited simultaneously is not yet known, and it is desired to complete the early wells in such fashion that intermediate cementations can be made at a later date with a minimum of difficulty. All wells are drilled with chemically treated mud weighing about 75 pounds per cubic foot. They are washed to bottom with water prior to completion and are started flowing by swabbing through 2½-inch tubing hung above the productive horizon. The wells are flowed through the tubing without surface restriction until clean of mud and water.

The oil-gas contact in the Ten Section field is at a depth of approximately 7650 feet below sea level; and the oil-water contact is at a depth of approximately 7950 feet below sea level in the several productive horizons. Early exploration indicates that these contacts are nearly horizontal throughout the field. Apparently oil and gas accumulated in this field without regard for natural barriers between the several sands comprising the Stevens zone. Subsequent exploratory development has shown, however, that there is no inter-conection between the several sand members within the limits of the field. Therefore, while the conditions at the time of accumulation resulted in the oil-water and oil-gas contacts being at approximately the same level in the several sands, it can be expected that the effect of depletion by production will be variable. Consequently, the oil and gas accumulations in the separate sands must be treated individually for the purpose of exploitation.

It will be appreciated that in an accumulation of this type the lateral extent of gas and oil will be the greatest in the uppermost zones. Therefore as locations lower on structure are drilled, exploitation must be confined to successively higher zones to avoid edgewater. Fortunately in the Ten Section field this can be done while still avoiding the gas cap of the shallower zones.

Gas-oil ratios typical of gas cap conditions have been experienced in several zones tested on the crest of the structure above the level of the oil-gas contact. Beneath the gas cap, oil is produced with a gas-oil ratio of approximately 700 cubic feet per barrel initially. This is believed to represent the normally saturated condition of the oil.

The potential oil production of the Ten Section field is currently about 15,000 barrels per day for the seven wells which have been completed. The allotment is approximately 3000 barrels per day. The rate of production per well is not uniform. It is chosen according to the well's structural position and the trend of the gas-oil ratio.

It has been observed from the brief history available that the wells in the vicinity of the gas cap have a tendency to produce at increasingly greater gas-oil ratios. To avoid such increases these wells, situated structurally high, are produced at lesser rates, and the wells producing in locations farther removed from the gas cap, and in a position where edgewater drive may be more effective, are produced relatively less curtailed. It has been observed that reducing the daily oil production of wells showing a tendency toward increasing gas-oil ratio has retarded such tendencies.

It has been the practice to measure the formation pressure in each new well after completion and thereafter at frequent intervals. These pressures are of the order of 3500 pounds per square inch, and while a total production of approximately 815,000 barrels of oil and 4,750,000 m.c.f. of gas have been produced thus far, it has not been possible, with the instrument available, to observe any reduction in formation pressure. It is believed that it will be possible with the exploration policy being followed to lay out a development and production program at a comparatively early date which will avoid wasteful dissipation of gas and energy from the gas cap. It seems likely that this can be done by confining exploitation to those portions of the productive horizons lying beyond or beneath the several gas caps; and thereafter by attempting to produce at such rates that the edgewater advancement will be sufficient to avoid down structure movement of these gas caps. To do this may require exploitation of the several zones in rings around the structure suitably located between edgewater front and gas cap.

Petroleum lubricants make machine age possible

In 1936 the world consumed 51,215,000 barrels of lubricating oil. In the United States a total of 22,500,000 barrels, or nearly one-half of the world consumption, was used in 1936. To maintain our present high standards of living, 28 gallons of petroleum lubricants per family were required last year.

Because gasoline is now the major product of the American oil industry, the basic importance of petroleum lubricants to our economic and social welfare is often overlooked. Scarcely a machine runs today that is not lubricated with mineral oil products. Through the development of oils and greases suited to hundreds of special uses, the shackles were thrown off machine inventors and designers. Human ingenuity could rise to new heights. Mass production was made possible. Production costs were reduced to a fraction of what they otherwise would be, and thousands of articles adding to the comfort and pleasure of life were made available to the masses.

Petroleum lubricants have added probably more to the sum of human happiness than any other basic factor arising in our productive system in the past century. Without such lubricants production costs for many commodities now in common use would be prohibitive. The automobile would still be a luxury, instead of developing to the point where two out of every three families in the nation are car owners.

Contrary to popular thought, the petroleum that comes out of the ground is not finished lubricating oil. The exacting requirements of modern machinery, from the giant rolling mills down through automobiles to delicate watch mechanisms, call for lubricants having a wide range of physical properties. But research in the petroleum industry has enabled the crude supplies of petroleum laid down by nature to be transformed into oils and greases meeting the varied needs of an expanding industrial system. The machine age was made possible by petroleum.

Bartlesville, Okla.—Phillips Petroleum Company has notified E. G. Dahlgren, state oil and gas conservation director it would purchase only 80 percent of January oil allowables from central and western Kansas oil wells serving its lines. The reduction will be approximately 3500 barrels under the allowable, or about 15,500 barrels daily as against the allowable of 19,000 barrels for the wells connected to Phillips' lines.

Wilson Creek, Colorado, well has 74 feet sand.

* * *

Middle Baxter basin test has gas blowout.

Casper, Wyo. — Logging 74 feet of saturated sand in the Sundance sand formation at 6824-98 feet this week, The Texas Company and The California Company's joint discovery well on the Wilson Creek structure, in Rio Blanco County, northwestern Colorado, is preparing to run a drill-stem test of the formation. Total depth of the well is at 6918 feet in the Sundance sand. Freeman-Government 1, CSE NW 35-3n-94w, made the most important discovery for the Rocky Mountain district in 1937 when it tested 1480 barrels of 43 gravity crude per day from the Morrison sands logged at 6664-6704 feet. The test was made through drill stem open 45 minutes and hole was then shut in and drilled ahead to test the Sundance bench of the structure.

While no test of the Sundance sand has been made, indications are that the formation will prove equally as prolific as the Morrison horizon and will probably result in the field having 2 developed producing horizons. Should such be the case it will probably be developed by the selective completion method developed by The California Company in its Quealy Dome wells where the casing is set on top of the lower producing sand and then perforated opposite the upper horizon, giving the field its main production from the upper, but leaving the lower sand readily accessible in case of an expanded market. A similar process is being carried out by Stanolind Oil & Gas Company in its deep Tensleep production campaign in the Salt Creek field in Wyoming.

The largest known geological structure in Colorado, Wilson Creek, will form an important reserve for Rocky Mountain oil deposits, possibly ranking with the Lance Creek and Cut Bank discoveries in Wyoming and Montana. With over 15,000 acres included within its lowest closing contours, the structure will embrace enough space to include nearly 400 wells drilled on the usual development program as followed in the Rocky Mountain districts, calling for the drilling of 1 well to each 40 acres. The structure is almost entirely included in a unit block which will hold drilling down to the developed market requirements and probably will result in the structure being developed at the rate of around 10 wells per year, indicating a long term of development for the area.

Middle Baxter Basin

In the Middle Baxter Basin field, Sweetwater County, southwestern Wyoming, Mountain Fuel Supply Company's E. S. Lauzer 1, CNW NW NW 30-18n-103w, struck a gas pocket at 1840 feet this week resulting in a blowout and fire which damaged equipment, forcing shut down of the well. No serious damage was reported, however, the well being brought under control, and operators are cleaning up the lease preparatory to resuming drilling. In the same field company's Betty Hoyt 1, CSW SW SW 32-19n-103w, is drilling at 1855 feet and Agnes Fay 1, CE NE SE 18-18n-103w, is drilling below 1807 feet. Rocky Mountain Drilling Company's Osborne 1, SE SE SE 12-18n-104w, Middle Baxter, is making hole at 2477 feet. J. S. Lee 1, CNE NW SE 10-19n-104w, in the North Baxter Basin field, Sweetwater County, is reported drilling ahead at 260 feet after spudding in early this week.

After completing its 2 active wells in the Quealy Dome field, Albany County, Wyoming, The California Company is stacking tools and probably will not resume drilling operations in the field before spring. There are a total of 15 commercial producers in the field, most of which are producing from the Dakota. The Muddy and Sundance sands have also been proven commercial productive in the field. The field is operated solely by Murphy Oil Company, a wholly-owned subsidiary of The California Company.

Early tests of Italo Petroleum Corporation's Phebus-Government 1, NW NW SW 11-44n-98w, northwest extension test of Hamilton Dome, Hot Springs County, north central Wyoming, indicate that the well will make up to 250 barrels per day from the Tensleep sand in which hole bottoms at 3246 feet. The sand was topped at 3206 feet. The well extends the proved limits of this field for another three quarters of a mile to the northeast and will probably result in the drilling of several wells during the coming year to determine the outside limits of commercial production for the structure.

Lance Creek continued its development campaign this week with the announcement by Argo Oil Company of a location in the proved sector of the western part of the field. Ford 5, SW SE 33-36n-65w, in Niobrara County, will be drilled as an offset to Ford 4 in the same section. Ford 4 found water in the Basal Sundance and drilled to the Minnelusa where it was completed for 175 barrels initial.

Mackinnie Oil & Drilling Company is preparing to complete Thompson 2, NE NE NW 7-35n-65w, on the west side of the field this week. Hole bottoms at 5269 feet where 7-inch production casing is set on top of the Minnelusa formation. Operators are waiting on drill pipe to drill in to test the sand.

The Ohio Oil Company has a well near completion in the Lance Creek field this week, Cash OPC-2 5, CNW SE 4-35n-65w, testing 146 barrels daily in the Basal Sundance formation at 4091-4129 feet. Total depth is 4131 feet, 2 feet in the red beds.

Stanolind Oil & Gas Company is still testing production in 2 deep wells in the Salt Creek field, Natrona County, central Wyoming. Wyoming Associated Oil Company-Tensleep 29, CSW SW 26-40n-79w, is bottomed at 4100 feet and is testing through perforations and Wyoming Associated Oil Company-Tensleep 11, CNE NW 35-40n-79w, Salt Creek, is testing through casing perforations with total depth at 4043 feet. Both wells bottom below the Tensleep horizon with casing set 1 foot off bottom of the hole.

Two other deep wells are underway in the field. Stanolind Oil & Gas Company's Wyoming Oil Company-Tensleep 11, CNE SW 35-40n-79w, is drilling at 3396 feet in the red beds and is nearing the Tensleep sand, generally encountered around 4000 feet. Tensleep 8, CNW NW 35-40n-79w, is drilling at 2704 feet.

MOUNTAIN STATES
Completions
COLORADO

Company, Well and Location	Init. Prod. Bbls.	Depth
LARIMER COUNTY—		
Great West O & G Co., Haworth 1, csw se 16-4n-60w	*	3887
LINCOLN COUNTY—		
Gulf, Union Pacific-Smith 1, csw se se 19-15s-85w	*	7096
WYOMING		
ALBANY COUNTY (Foote Creek Structure)—		
Ohio, D. J. Griffin 2, csw se sw 2-21n-77w	*	3536

*Failures; †Junked; ¶Million cu. ft. gas.

North Dakota test reaches 6220 feet

Minot, N. D.—Standard Oil Company of California's deep wildcat on the Nels Kamp farm, Williams County, was reaming out from 6220 feet last week in preparation for sinking pipe casing to that depth. Drilling was to be resumed after the casing had set. The Kamp well is the first deep test to be drilled in North Dakota and the location was chosen after extensive geophysical exploration for the Standard company.

Corings have been made with great frequency during the past few weeks, but rumors that traces of oil were found in the past 1000 feet were unconfirmed by officials, who are guarding information on formations. A laboratory has been established at the well site which is in charge of Ed Young, petroleum engineer, who is assisted by Tom Newbill, both of Denver, Colorado, offices of the Standard company.

NORTH TEXAS FIELDS

K-M-A southwest extension test shows for production.

* * *

Archer County wildcat projected for deeper search.

Wichita Falls, Texas.—Adequate oil saturation in the Strawn horizon to indicate a probable producer was encountered by Geier Bros., Inc. and F. B. Jackson, Jr.'s C. F. Ancell 1, situated 3½ miles southwest of nearest deep production in the K-M-A field and a short distance north of the Wichita-Archer County line. This outpost checked 161 feet lower structurally on top of the big lime than Consolidated Oil Company et al's Ferguson 1, nearest producer, in topping same at 3837 feet, with an elevation of 1051 feet. First saturation was reported in sandy-lime zone, testing 30 percent sand, at 3955-62 feet. Sand content diminished in coring to 3977 feet, where operations were halted to cement a string of 7-inch pipe for a production test. Ancell 1 is in the northeast corner of the Walker-Montgomery Survey, and south of the C. Roberts Survey, A-540.

E. J. Stump et al's M. P. Bishop 1, L. Netherly Survey, A-240, listed last week as a doubtful producer about 1⅞ miles south by east of the most easterly producer, remained idle at 4043 feet, where it filled 25 feet with oil in 12 hours. Top of lime was called at 3795½ feet, with an elevation of 1025 feet, or 16 feet higher structurally than Ancell 1. The two prospects are about 11 miles apart.

Toddie L. Wynne, Trustee's Waggoner Bros. 1, SWc lot 36, H. George Survey, A-454, located between north outpost producers and 1-1/3 miles northwest of nearest production, encountered a comparatively thin oil horizon in drilling to 3913 feet, or 2876 feet sub-sea, with the last 28 feet identified as shale. Flowing by heads at rate of 300 barrels daily natural, this outpost logged oil sand at 3876-3885 feet. Top of lime was called at 3729 feet, with an elevation of 2692 feet. Manson Oil Company's T. F. Mitchell 1, Block 10, Col. Tap. Ry. Survey, A-51, about 1 mile west of the northeast outpost producer, logged top of lime at 3779 feet, with an elevation of 1028 feet. Sandy-lime at 3919-26 feet carried odor and oil stain, and no recovery was made in coring to 3932 feet. Lime was logged at 3932-38 feet, followed by shale to 3944 feet. Pipe will be set for a test.

Burk Royalty Company's W. L. Warren 1, near NEc Block 32, KWVFL Survey, southeast outpost, being 1 mile south of production, carried little saturation in sandy-lime and shale section at 3775-3890 feet, but has cemented pipe to test sand and oolitic lime logged at 3890-3908 feet. Top of lime was called at 3775 feet, or 2762 feet sub-sea.

High-Priced Lease

Prince Bros. Drilling Company's C. P. Sheldon 1, 2.9-acre strip lease near northeast corner of P. Castleman Survey, and 2200 feet north of the first big well on the west side of the field, is probably the highest priced drilling site. Sheldon, former chief geologist for Texhoma Oil & Refining Company, received $6,000 cash and $9,000 payable from oil production, and retained ¼ royalty for this strip property.

Deep Oil Development Company, discoverer of the deep horizon, has placed in operation its natural gasoline and gas re-cycling plant in the heart of the field. Gas yields an average of 2½ gallons per 1000 cubic feet. The company has equipment to return about 1,000,000 cubic feet of residue gas to the Strawn zone, and has conditioned Munger 2-A, NW Block 30, KWVFL Survey, to serve as the input well.

Deep exploratory work arising from the K-M-A boom was extended into northwest Archer County when Wayne King, H. R. Edwards et al started moving in to drill Jessie C. Arthur 1, located near center of west line of GH&H Section 3, A-158. Location is 4 miles south of Dundee. This wildcat is contracted to go to 4000 feet.

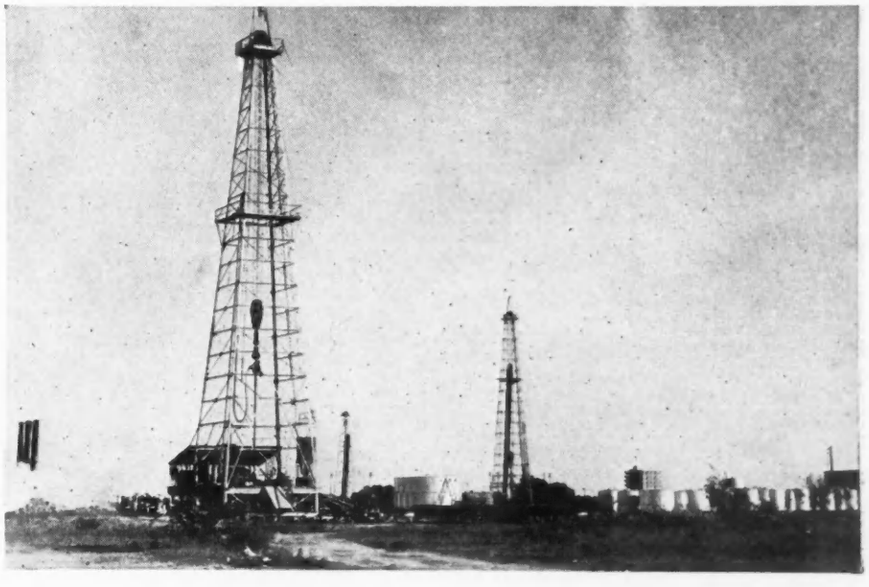
Another Strawn project for Clay County is pending. J. Ben Russell and L. E. Bowles, Oklahoma operators, have assembled a 3000-acre block immediately southwest of Henrietta, and have contracted to drill a 4000-foot test.

Helium gas for the balloons of Germany

A recent event of considerable importance is the first export of helium gas from the United States. Approximately 18,000,000 cubic feet of this colorless, non-inflammable gas will be exported to Germany, where it is destined for use in a new Zeppelin.

Helium gas was first observed in 1868 when scientists discovered it in the spectrum of the sun's atmosphere. In later years, however, it also was found to be present in natural gas from which it was separated. Prepared from minerals, helium is a product of radioactive transformations. Although a small volume of this gas is found in numerous parts of the world, the Texas Panhandle is the only area where helium is produced in commercial quantities.

During the past several years helium gas was offered to Germany for use in dirigibles, but due to the greatly in-



Looking east across the new deep area of the Refugio field, Refugio County, Southwest Texas, where sands ranging from 6600 to 7100 feet have been uncovered. This field was discovered in 1920 with a gas completion at 1902 feet. A large number of oil and gas producing sands now give it practically a continuous pay zone down to 7100 feet.

creased cost this country declined to make use of this offer. However, recalling the great disaster of the Zeppelin "Hindenburg" last year, Germany seems now willing to import helium and pay a considerably higher price for it than it has been paying for hydrogen, which was used in the past.

Although helium has only 92 percent lifting power as compared with that of hydrogen gas, it is absolutely harmless, and it is for this reason that Germany is willing to pay now almost any price in order to make a safe transportation of Zeppelin passengers possible.

K-M-A river bed lease cancelled by Texas

Austin.—Differences between Governor James V. Allred and State Land Commissioner W. H. McDonald over the disposition of leases controlled by the State Board of Mineral Development, of which both are members, have resulted in a distinct break between the two officials.

The matter is of importance to oil operators because the Board leases many State lands for oil, and especially the riverbed tracts. Recently, McDonald extended the lease of Venmex Oil Company on the Big Wichita River after the K-M-A oil field came in. Allred discovered that the Venmex had failed to make all payments due, and attacked the action of the Land Commissioner. He insisted that the lease should have been cancelled.

Acting on this request, Land Commissioner McDonald has cancelled the lease during the past week, and at the same time issued a statement asserting that he had acted on precedents established by Allred during the time that the Governor was Attorny General, and since he had advanced to the post of Governor.

Subsequently, Venmex Oil Company paid up the sums past due, and Attorney General McCraw, acting on the request of Allred, filed suit against the Venmex Company in the 98th District Court, seeking to recover title to the property. Allred has retained Everett Looney, his former assistant in the Attorney General's office, to aid in prosecution of the suit.

Meanwhile, the Senate Investigating Committee has obtained the transcript of a meeting of the Board of Mineral Development which took place in December, at which Allred and McDonald had heated arguments over the proper method of handling State leases. The Committee has promised an investigation during the latter part of January.

In cancelling the lease, McDonald pointed out that he was using that method because several other State leases are about to expire, or have expired, and he was anxious to settle finally the proper method of handling these properties.

Allred last week also refused to approve a patent on a vacancy which McDonald had issued on a 48-acre tract in Rusk County. In making this announcement, Allred said that he was dissatisfied with his legal advice from Attorney General William McCraw on land matters, and that he has employed as special counsel, Major J. W. Hawkins.

Thus the land questions took on a political cast, as many believe that Allred will oppose McCraw for the Governorship next year, and last year McDonald defeated Hawkins for the post of Land Commissioner.

Charles Gill Morgan, vice president of United Geophysical Company of Pasadena, left this week by plane from Los Angeles for South America. Morgan will return to California in February.

NORTH TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ARCHER COUNTY—		
Burns et al, Abney 2, sec 1	3	424
Martin & Hines, Wilson 4, sec 2	*	1628
Parks et al, Rater 1	*	1756
Westmount Oil Co., Dempsey 4, blk 10	81	1798
Whitehill Oil Corp., Morrison 28, blk 4	2	673
BAYLOR COUNTY—		
Consolidated Oil Co., Portwood 4-EE, sec 1279	*	1425
CLAY COUNTY—		
Bridwell Oil Co., Edrington 5-A	2	200
COOKE COUNTY—		
Pace Pet. Co., Winstead 2-B	5	903
GRAYSON COUNTY—		
Denver P&R Co., Moore 1	*	3524
JACK COUNTY—		
R. H. Dearing & Son, Raley 8-B	203	3252
Hill & Hill, Clayton 5-B	50	3123
Long & Wolf, Box 2	*	2994
Perrin & Gillespie, Clayton 3	151	3050
Taubert & McKee, J. M. Box 4	234	3209
MONTAGUE COUNTY—		
Bridwell Oil Co., Salmon 14-A	10	1015
WICHITA COUNTY (K-M-A)—		
Burns et al, First Nat'l Co. 21, lot 5	570	3843
Cato Oil Co., Kemp 1, blk 1	1210	3742
Christie-Hickman Drl. Co., Bolding-Lowry 1, blk 23	690	3750
King Oil Co.-Perkins-Cullum, Mangold 1, blk 38	4300	3727
W. H. Peckham et al, Munger 1, blk 31	710	3867
Petroleum Prod. Co., First Nat'l Co. 2-H, blk 28	759	3860
Reed-Glass & Crenshaw, First Nat'l Co. 13-B, blk 26	600	3845
WICHITA COUNTY—		
Cooper et al, Hirschi 1	*	3283
Freundlich et al, Love 3	*	502
Ligon et al, Foster 1	*	1952
Medders et al, Waggoner Est. 1-B, sec 13	*	1750
Ryan Cons. Pet. Corp., Nance 127	10	499
YOUNG COUNTY—		
Chambers & Humphreys, Benson 7, sec 1392	25	904
Benson 8, sec 1392	56	911
Lupton & J. McLester, Brown 2	286	3852
Strong et al, Kunkel 1, sec 605	780	3939
Wichita Prod. Co., Texas Land & Mtg. Co. 1, sec 207	*	818
Willis et al, E. Lennington 1	*	810

*Failures; †Junked; ¶Million cu. ft. gas.

WEST CENTRAL TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BROWN COUNTY—		
Sandefer et al, Shore 1	20	2395
CALLAHAN COUNTY—		
Walker & Webb, Ross 1	*	2001
COLEMAN COUNTY—		
Brannon & Murry, Younglove 6	*	1331
Crabb & McNeil, Neeb 1	*	1245
Dixie O&G Co., Reeves 1	*	1331
EASTLAND COUNTY—		
Deaner et al, Higgins 1	15	1155
PALO PINTO COUNTY—		
Gable & Moore Drl. Co., Costello 1	*	2718
SHACKELFORD COUNTY—		
Bailey, Tr., Diller 1	10	528
Baker et al, M. Davis 1	*	1774
Charter O & G Co.-Pet. Producers Co., Davis 1	15	1562
Hickok P&D Co-Reynolds, Baker 2	*	1738
Mesa Verde Oil Co., Hennessy 1	*	1925
Roeser-Pendleton, Inc., E. S. Dawson 45, sec 202	90	1619
Roeser-Pendleton-Humble, Morris-Buie 4, sec 205	*	2143
Simmons et al, Harvey 15	*	1745
Tannehill et al, Mathews 38	*	1007
STEPHENS COUNTY—		
Perren et al, Iles-Hughes 1	150	4011

*Failures; †Junked; ¶Million cu. ft. gas.

WEST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CRANE COUNTY (Gulf-McElroy)		
Gulf, McElroy 166	1579	2947
CRANE COUNTY (Jordan)—		
Texas Co., University 2-D	4771	3560
ECTOR COUNTY (North Cowden)		
Ohio, L. E. Wight 2	693	4240
ECTOR COUNTY (Foster)—		
Barnsdall, J. L. Johnson 3	521	4290
Sunray-York & Harper, Inc. Bagley 2	554	4316
ECTOR COUNTY (Goldsmith)—		
Amerada, H. E. Cummins 4	488	4259
American-Maracaibo Co., C. Scharbauer 1-B	747	4190
Gulf, C. A. Goldsmith 56		4280
C. A. Goldsmith 57	445	4215
Humble, C. Scharbauer 5-C	305	4212
Phillips-Pure, C. Cowden 16	596	4165
Shell, T. P. Land Trust 1-B	65	4275
T. P. Coal & Oil Co., C. Scharbauer 12	3675	4275
ECTOR COUNTY (Harper)—		
Broderick & Calvert, Cowden 4-C	2414	4282
J. E. Mabee & Blackstock, Elliott Cowden 2	786	4285
ECTOR COUNTY (Judkins)—		
Skelly-Atlantic, University 2-D	751	3650
FISHER COUNTY (Rotan)—		
Magnolia, D. L. Smith 1	174	3534
Snowden & McSweeney Co., W. L. Morrow 1	370	3537
Sunray Oil Co., Robinson 8	598	3530
GAINES COUNTY (Wasson)—		
Continental-A. G. Carter, Wasson 2	543	4985
HOCKLEY COUNTY (Slaughter)—		
Texas Co., Slaughter 2	620	4985
HOWARD COUNTY—		
Magnolia, Roberts 22	1099	2565
W. E. Production Co., Wilcox 2	12	3318
JONES COUNTY—		
Campbell et al, J. H. Lee 1	*	2450
Danciger, Guitar 4	728	2007
Fain-McGaha, W. F. Bean 1	*	3610
L. E. Williams 1	984	1956
Thos. D. Humphrey et al, F. T. Moore 1	*	2005
Lewis Prod. Co.. H. Sayles 9	432	2002
Petroleum Prod. Co., J. S. Milsap 1	383	1958
R. H. Roark et al, W. W. Toombs 1	*	2490
Sinclair Prairie, B. King-H. Dorsey 11-B	144	2224
Trippett et al, Guitar Est. 13	158	2014
Ungren & Frazier, H. Dorsey 15-C	81	2085
Manley 1	*	2255
Waite, Tr., B. T. Ray 1	*	3510
PECOS COUNTY (Pecos Valley)—		
Hayward et al, Sanford 1	*	1490
PECOS COUNTY (Toborg)—		
Cardinal Oil Co., Tippett-Kirby 51-E	14	539
PECOS COUNTY (Wildcat)—		
Mike L. Benedum et al, Joe C. Trees 1	*	4995
TAYLOR COUNTY—		
Dale H. Dorn et al, Hopkins 1	*	3667
Golden Pet. Co., C. Braune 1	*	3668
UPTON COUNTY (McCamey)—		
Gulf, Rogers 10	481	2241
Texas Co., Cordova Union 1	450	2347
Richard King 37	264	2264
WARD COUNTY—		
Cities Service, Brandenburg 1	*	2245
Gulf, E. W. Estes 69	2253	2680
G. W. O'Brien 89	191	2766
Humble, L. Richter 25	840	2610
Standard (Texas), McFarland 19, sec 37	192	2650
WINKLER COUNTY (Kermit)—		
Gulf, O. Clapp 23	577	3090
O. Clapp 24	¶8.3 & 3	3099
Humble, Colby 25-C	500	3070
YOAKUM COUNTY (Wasson)—		
Denver P&R Co., Whittenburg 2	661	5098
Shell, Baumgart 1-A	486	5000
YOAKUM COUNTY (Wildcat)—		
Murchison-Fikes et al, Sawyer 1	*	5255

*Failures; †Junked; ¶Million cu. ft. gas.

WEST TEXAS FIELDS

Slaughter well boosts area's importance.

* * *

Yoakum and Cochran wildcats testing shows.

Midland, Texas.—The Slaughter area, southwestern Hockley County, has qualified as one of the important 1937 oil strikes for the Permian basin through development of attractive production about midway between the 2-mile interval that separates the first projects. Outpost tests to the southwest and southeast are to be started immediately by Gulf Oil Corporation. This pool and the Duggan field, located to the west in southeastern Cochran County, are the northernmost oil areas in the basin, but are not considered the deadline for production along the north trend.

The Texas Company's Bob Slaughter 2, SEc Labor 92, League 37, enhanced the rating of the Slaughter pool as a crude source in registering an initial flow of 532 barrels of oil through 7/8-inch tubing choke after treating lime section at 4920-4985 feet with 2000 gallons of acid. Gas/oil ratio on this test was 1389/1. Honolulu Oil Corporation is due to start an east offset shortly. The Texas Company proposes to carry on a continuous drilling program on its 6219-acre Slaughter lease. Sid W. Richardson et al's Slaughter 1, 2 miles north of the discovery, was drilling at 3900 feet. Gulf Oil Corporation has made location for Mallet Land & Cattle Company 1, NEc PSL Section 6, Block X, same distance southwest of the original producer, and also for M. G. Gordon 1, NWc PSL Section 12, Block X, being 3/4-mile southeast of Stanolind Oil & Gas Company's flowing producer.

Development of attractive production midway between the two isolated producers in the Slaughter pool, southwestern Hockley County, has resulted in Gulf Oil Corporation starting work on outposts two miles southwest and three-quarters mile southwest of the original wells, indicated by circle. Sid Richardson et al are seeking production from the 4900-foot lime about two miles due north of The Texas Company's Bob Slaughter 1, discovery well. Continuous drilling is in store for this extreme northeast Permian area. A tank farm is to be erected to serve the wells until The Texas-New Mexico Pipe Line Company extends its line north from Crane station.

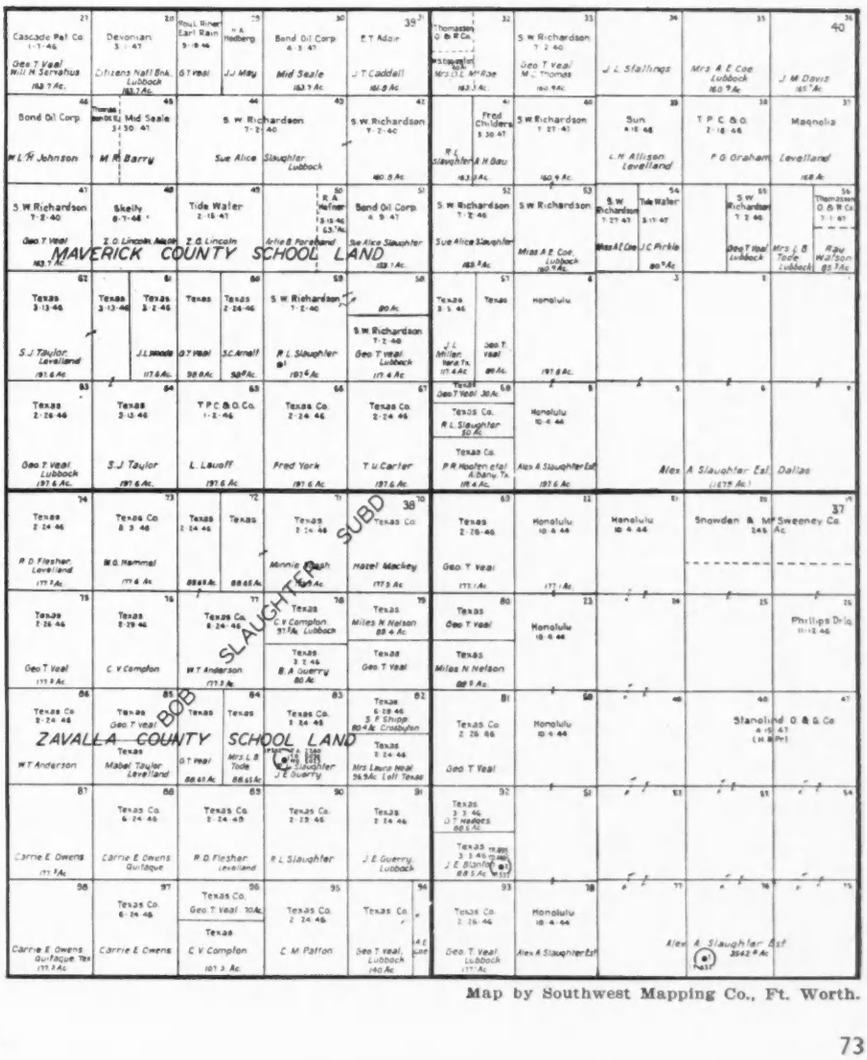
Production test was in progress late last week on Lou Stogner & Pipkin's Blades-Pollard 1, northwestern Yoakum County wildcat, with the hole bottomed at 5266 feet, or 1415 feet sub-sea. The hole yielded 3/4-bailer drilling fluid per hour for 24 hours, and did not materially lower the fluid level. Pipe was cemented after coring broken saturated lime below 5198 feet. This wildcat occupies a high structural position for the area. Gulf Oil Corporation has taken out permit to drill S. J. Dixon 1, SW SE SE Section 609, Block D, located on a line between the Bennett field and the Bohago one-well pool, Yoakum County. The company has a large lease block in the area, and may delay operations to observe the outcome of two semi-wildcats to the west.

Cochran County Wildcat to Test

J. R. Meeker et al's D. S. Wright 1, Cochran County wildcat 4 miles southeast of Lehman, cored oil stained lime at 4865-73 feet and 4876-89 feet, with an elevation of 3774 feet. Coring continued to 4934 feet, and pipe will be set for a production test. Wright 1 is in southeast part of Labor 26, League 96, Mills County School Lands, on a block originally assembled by the Harris-Anderson Corporation. Top of lime was logged at 4105 feet, or about 159 feet higher than nearest production in the Duggan pool.

Most promising wildcat development in Martin County, which has no production although counties to the east, west and north have one or more pools, is centered upon Harris-Anderson Corporation and W. E. Production Company's Mollie Robinson 1, C SW of T&P Ry. Section 33, Block 36, T-1-N. Swabbing test was due last week after coring favorable saturation in lime at 4160-4179 feet, with an elevation of 2776 feet. Top of lime was called at 3720 feet. Location is 6 miles northwest of Stanton.

Continental Oil Company's Clayton-Johnson 1-A, Borden County wildcat, encountered sulphur water in Permian at 3495-3538 feet, with an elevation of


MAVERICK COUNTY SCHOOL LAND
ZAVALLA COUNTY SCHOOL LAND
BOB SLAUGHTER SUBD
Alex A. Slaughter Est., Dallas
Alex A. Slaughter Est.

Map by Southwest Mapping Co., Ft. Worth.

2534 feet. Plugging orders have been issued.

Pecos County Ordovician Test

Magnolia Petroleum Company et al's McKee 1-A, northern Pecos County Ordovician project, has encountered an unusually thick section of Simpson, or mid-Ordovician, and is credited with having cored soft lime at 5273-75 feet, followed by sand and lime section at 5275-95 feet. Brisk lease and royalty play followed when this wildcat entered the Simpson at 4775 feet, or 2390 feet sub-sea, and halted operations at 4914 feet early in November to perfect titles. The test had not drilled through the Simpson at 5214 feet, and the recovered cores did not warrant setting pipe.

Gulf Oil Corporation's McKnight 3, located 2¾ miles northeast of the company's nearest Ordovician production in the Sand Hills field, Crane County, has cemented 7-inch at 6050 feet to test minor saturation registered by cores pulled from the Simpson section at 6079-6164 feet, and Ellenberger lime at 6164-6175 feet. It has an elevation of 2693 feet. Bomb run to the bottom of the hole registered 3500 pounds hydrostatic pressure. This outpost encountered only 85 feet of Simpson, while the company's Waddell et al 2, nearest deep test, cored 512 feet of Simpson, then tested water in Ellenberger at 6507-6709 feet. It was completed as a pumper in the upper Simpson. H. F. Wilcox Oil & Gas Company's McKnight 1, northwestern Crane County wildcat, was having difficulty in restoring circulation after encountering a cavity at 7049 feet.

Moore Bros. Corporation et al's Paul Perner 1, western Crockett County Ordovician project, is the deepest active test in the district, and was drilling in shale at 8620 feet. Floyd C. Dodson, Duffey et al's Texas American Syndicate 1-A, northern Brewster County wildcat, was drilling in sandy-lime at 6570 feet.

International Exposition to add third new building

A third new permanent exhibit building will grace the grounds of the International Petroleum Exposition, at Tulsa, when the gates swing open May 14.

This $10,000 edifice, to be named in honor of Kansas for its participation in the history of the petroleum industry, will be 200 feet long, 120 feet wide and will contain a total of 12,800 square feet of exhibit space. Some of the displays in this building will be centered in the 55 booths, 10 feet square, that will grace the interior.

This new permanent exhibit building has been added to the Exposition by the record-breaking demands for exhibit space at the oil show. The Exposition is still five months off but Exhibitors have already contracted for 60 percent more space than was sold for the entire 1936 oil show. Thus it is easily seen why the International Petroleum Exposition, May 14 to 21, has inaugurated a $250,000 building program that will provide two new exhibit buildings and a new Hall of Science for the exhibitors and a new modernistic, air-conditioned cafeteria for the visitors to the tenth oil show.

Lower Trinity no good in Sulphur Bluff field.

* * *

Anderson County gasser is drilling deeper.

Tyler, Texas.—Elimination of the lower Trinity as a source of production for the Sulphur Bluff faulted field, Hopkins County, occurred when Walter L. Goldston and Normandie Oil Corporation's Smith 10, J. A. Craft Survey, found water in the second Glen Rose lime series at 5795 feet. Drilling was in progress at 6200 feet to fulfill 6600-foot depth contract. Hole will be plugged back for completion in the Paluxy near the 4500-foot level.

Sulphur Bluff was considered a good prospect for production in the Lower Trinity, but the above test provides no encouragement for continued exploration. First anhydrite stringer was logged at 5510 feet, with an elevation of 439 feet, and massive anhydrite was called at 5605-5707 feet. Red Beds were entered at 5760 feet.

H. L. Parsons et al's Hemby 1, southwestern Anderson County wildcat previously listed as showing for a gasser in the Woodbine, was coring at 5450 feet to establish the water table. Owners plan to cement pipe, then plug back and perforate opposite the main gas zones found in the Upper Woodbine, which was topped at 5360 feet, with an elevation of 263 feet. Location is in the John Gossett Survey, 5 miles southwest of Elkhart.

Texas gets 126 new starts

The Texas Railroad Commission granted 126 permits this week for drilling new wells in Texas, 21 more than were approved last week.

East Texas operators reported 11 locations, including four in Gregg, three in Rusk, three in Upshur and one in Smith County. There was only one permit granted in the East Central Texas District.

West Texas reported 34 permits including 10 in Ector County, while West Central Texas operators listed 16.

There were 28 permits granted in the Gulf Coast area, and 22 new locations listed from Southwest Texas.

North Texas operators reported nine new locations while the Panhandle listed only five.

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARSON COUNTY—		
Danciger, J. L. Moore 6	190	3057
Great West Oil Co., B. F. Block 2..	237	3159
L. R. Hagy, Marsh & Harrington, Gorenflo 3	¶13.7	2683
Panhandle Eastern, Sanford 1, sec 13	¶42.9	2710
Stanolind, E. Cooper 8	301	3174
GRAY COUNTY—		
Cities Service, Cunningham 13	399	3296
Humble, Haggard 5	633	3250
HUTCHINSON COUNTY—		
Alma Oil Co., Whittenburg 1-A	544	2705

*Failures; †Junked; ¶Million cu. ft. gas.

Midland, Texas.—Atlantic Pipe Line Company has stepped up its crude shipments from New Mexico and West Texas from 20,000 barrels to 25,000 barrels daily by placing auxiliary pumping units in service at 4 main-line stations between Midland and Atreco.

EAST TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Ambassador Oil Corp. (was Londo Oil Co.), London School 2 (2.79-ac)	7000	3765
Fischer et al, Wilson 3-B (¾-ac)..	6800	3763
R. W. Fair Oil Co. & Thompson, Deason 5 (10-ac)	480	3661
Humble, Turner 16-A (126.26-ac)....	8600	3693
Wheelis 24 (168.3-ac)	5400	3732
P. G. Lake, Inc., Reid 17 (120.1-ac).	1200	3639
McMurrey Pet. Corp., Roberson 15 (145.8-ac)	2200	3820
Pine Pet. Co., Giles 9 (30.44-ac)....	†	3450
Sun, Burns 11-a (109.98-ac)	1200	3750
KILGORE AREA—		
Gen'l American Oil Co., J. Douglas-Shell 17 (137.93-ac)	2400	3672
Gulf, Spear 42, Tr. 4 & 5 (93.72-ac).	5000	3568
Humble, Knowles 29 (100-ac)	4200	3595
T. L. James & Co., L. Lacy 12 (21½-ac)	3600	3575
Magnolia, Mitchell 7 (20.68-ac).....	500	3631
Meco Prod. Co., Williamson 15 (150-ac)	2000	3702
Navarro Oil Co., Brightwell 29 (113.7-ac)	6800	3640
B. F. Phillips et al, Greggston 3 (51-ac)	160	3590
Potter Bros.-W. L. Humphries, Thompson-James 1, blk 152	240	3546
Sinclair Prairie, Kennedy 1-E (74.1-ac)	144	3600
H. R. Smith, Inc., Peterson 5 (6.48-ac)	3600	3576
L. J. Wardlaw et al (was R. C. Brantley), Camp 3 (41-ac)	210	3535
LONGVIEW AREA—		
Amerada, Freeman 4 (28-ac)	4000	3694
Tooke 11 (60-ac)	9300	3524
Tuttle 8 (48-ac)	8500	3532
Atlantic, Tooke 8-B (44-ac)	10,000	3668
Carey et al, Richey 1-B (1-ac)	8000	3584
J. W. Croley - G. M. Cosby, Christian 3 (2-ac)	7800	3605
Dyck Oil Co., Christian 12 (37-ac)..	8500	3580
Ellis Oil Co., Mackey-Humble 20 (147.1-ac)	1500	3668
Gen'l American Oil Co., Harris 25 (48½-ac)	4000	3507
Erle P. Halliburton, Loden 12-C (54.6-ac)	7200	3659
Humble, Clemens 12 (75.2-ac)	4800	3720
Killingsworth 18 (99.7-ac)	9300	3570
Magnolia, Christian 19 (64.95-ac)...	9500	3645
Christian 21 (64.95-ac)	9000	3665
P. F. Rutledge-C. W. Boller, Todd 14 (155-ac)	20	3742
Shell, King 28 (160-ac)	9000	3625
Moore 12 (47.73-ac)	9600	3579
Stanolind-Reddic & Hugus, Christian 4-A (20-ac)	7800	3640
Sun, Hargrave 22 (199.3-ac)	1500	3688
Superior Oil Co., Jones 12 (64.32-ac)	10,400	3669
Texola Drl. Co. (was Twin Oil Co.), Mackey 8 (59.2-ac)	750	3724
Tide Water Associated, Jones 16 (80-ac)	8200	3648
FRANKLIN COUNTY (Talco)—		
L. S. Flannery, Inc., Hedrick 11 (65-ac)	412	4315
Housh & Thompson, Owings 11 (109-ac)	400	4270
Magnolia, Maxton 5 (326½-ac)	353	4314
TITUS COUNTY (Talco)—		
Byrd & Frost, Belcher-Gulf 6 (80-ac)	463	4291
VAN ZANDT COUNTY (Van)—		
Pure, A. R. Humphreys 7 (100-ac)..	167	2942

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTHWEST TEXAS

Northwest-of-Saxet strike revives Nueces interest.

* * *

Valley try for deep oil production again abortive.

* * *

North Sweden gains further importance through strike.

SOUTH TEXAS Completions

Company, Well and Location	Init. Prod. BBls.	Depth
CORPUS CHRISTI DISTRICT		
ARANSAS COUNTY—		
Atlantic, Porterfield 3-A, McCampbell	400	7280
Porterfield 1-C, McCampbell (sd/tr td 6887 feet)	150	8889
Buckingham, Porterfield 4-D, McCampbell	525	7228
BEE COUNTY—		
Dougherty, Hicks 4, sw Normanna..	*	4628
CALHOUN COUNTY—		
Humble & Plymouth, Welder 15, Heyser	650	5479
Sinclair Prairie, Bennett 7, Heyser..	650	5745
HIDALGO COUNTY—		
Fohs, Guerra 2, Samfordyce	*	2982
JIM WELLS COUNTY—		
Smith & Storey, McGill 2, Armagosa, N. Gussett sur No. 98	¶20	2196
KARNES COUNTY—		
Luling, Boyce 16, S. Burnell	450	3659
KLEBERG COUNTY—		
Superior, Koch 1, blk 32, sec 26, Koch subd	*	7522
LIVE OAK COUNTY—		
Southwest, Hill 5 (Ezzell)	86	1486
NUECES COUNTY—		
Douglas, McKinzie 1, W. Saxet	1250	5812½
Houston, Morgan 34, Saxet	400	4861
Humble & Barnsdall, Gulden 4, Flour Bluff	600	6665
Renwar & Maryland, Morgan 2-C, Saxet, perf 4005-15 feet	¶20	7131
Richardson, Harrell 4, Saxet	†	6007
Quiroz 14, Saxet	500	6754
REFUGIO COUNTY—		
Quintana, Mrs. F. V. W. Heard 11, Tomoconnor (perf 5852-62 feet)	2750	5925
O'Connor 60-A, Tomoconnor	1350	5963
SAN PATRICIO COUNTY—		
Humble, Schroeder 1, Taft	†	5050
VICTORIA COUNTY—		
Bowles, Robertson 1, East Telferner, sd/tr td 5114 feet	800	6138
MIRANDO DISTRICT		
DUVAL COUNTY—		
Colmena, Duval County Ranch 8, Colmena	75	1430
Gravis, Vaello 1-A, N. Sweden, (pref 3965-72 feet)	¶15 & 35	6018
Gulf Stream, Hoffman 7-B, Hoffman.	27	2794
Magnolia, Duval County Ranch, Piedre Lumbre	196	2046
Mortimer, Peters 2-A, Peters	†	1572
Navarro, Rossi A-1, N. Sweden	550	5331
Reynosa, Rodriguez 1, Seven Sisters.	65	1491
Soverign, Benavides 1, Cole-Bruni..	*	3609
JIM HOGG COUNTY—		
Darby, Holbeia 2-B, Las Animas...	225	1828
STARR COUNTY—		
Calderoni, Calderoni 1, J. of Camargo	*	1603
WEBB COUNTY—		
French, Perez 9, Killam	130	2003
Jones, Saenz 1, Killam-Oilton	275	1925
Killam, Bruni 4, survey 585	*	3505
Moore, Martin 1, Oilton	180	1894
Mortimer, Welhausen (Frost) 1, survey 73	*	2705
Mountain Townsite, Fee 1, Oilton...	125	1921
Nessly, Bruni 3, survey 449 (perf 1804-08)	¶7	1850

Corpus Christi.—South Texas Gulf Coast's play is off to a running start in 1938, Late in 1937, indications were that a material decline in activity was evident for the Frio-sand trend, but one discovery after another has materially changed that picture. Nueces County's rapidly waning interest became almost as bright as ever January 4 when L. A. Douglas' Charles McKenzie 1 flowed at the rate of 576 barrels per day through ¼-inch choke to open the West Saxet field.

The test, located two miles northwest of the Saxet field, is in a Frio sand at 5794-5812½ feet, casing being set on bottom and perforated at 5810-12 feet with six shots. The test was at last reports flowing 24 barrels of 35.2 gravity crude per hour through ¼-inch choke and showing pressures of 850 pounds on both casing and tubing. It was making a slight cut of b.s. and w. The gas/oil ratio is relatively low.

This strike is looked upon as important, expected to cover several thousand acres and embraces acreage owned by a number of companies. Plymouth Oil Company, C. Andrade III, Houston Oil Company of Texas, L. A. Douglas, Renwar Oil Corporation, Sun Oil Company, Phillips Petroleum Company, Southern Minerals Corporation, and others have nearby holdings. Phillips Petroleum Company owns one-half interest in the well and acreage, acquired from Douglas subject to the drilling of the well. This concern had shot the area and drilled one failure on the prospect prior to its testing by the discovery well.

SAN ANTONIO DISTRICT		
ATASCOSA COUNTY—		
Stieren, Crawford 1, J. O. Crawrors sur No. 69	*	3867
BEXAR COUNTY—		
Baker, Baker 6, Von Ormy	2	804
CALDWELL COUNTY—		
F. & W., Rodenberg 1-C, ne Luling.	100	2238
Gillock, Kelley 1, Francis Berry sur	*	1841
Lanning & Coffield, Withers 3, ne Luling	120	2239
Murchison, Closuit, Reed, Jennings 4, Luling	350	2080
Taylor, Brown 2, Luling	250	2158
FRIO COUNTY—		
Amerada, Halff & Oppenheimer 8, Pearsall, PB/td 5800 feet	130	10,741½
GUADALUPE COUNTY—		
Blanco & Buchanan, Howell 1, Jacob Darst survey	*	3342
WILSON COUNTY—		
Richardson, Heirholzer 1, R. Salinas survey	†	930
ZAPATA COUNTY—		
Dulup, Trevino 31, Escobas	10	1250
Oil Country, Benavides 1, Andrews, (perf 1374-79 feet)	¶3	2312

*Failures; †Junked; ¶Million cu. ft. gas.

Refugio County Discovery

Refugio County also added a discovery, being Union Producing Company's Phil Power 9, on the east flank of the Refugio field. The well initially flowed about 5 barrels of 38.5 gravity crude per hour through ⅛-inch choke with pressure of 2120 pounds on tubing and 2450 pounds on casing after casing was perforated at 7700-3 feet. There was a cut of 15½ percent basic sediment and water. This is the deepest sand uncovered in this section of the Gulf Coast and is from the Frio zone. The salt water increased and the hole has been plugged back to the 6800-foot sand.

In Nueces County, Richardson Petroleum Corporation is preparing to drill ahead after testing salt water through perforations at 5416-26 feet, total depth being 5432 feet. The well is J. O. Chapman et al 1, one mile northeast of the Luby field, and attempted to open a new sand for that area.

Weather has materially slowed drilling along the Gulf Coastal trend. Much of the territory is completely underwater or rainsoaked roads prevent the movement of material and supplies.

Hidalgo County try for 9000-foot oil again fails

Mission.—Attempts to open South Texas' first field below 9000 feet have proved fruitless thus far with Atlantic Refining Company preparing to perforate higher in Amerival Rio Grande Land & Irrigation Company 1, 2 miles southwest of Weslaco in Hidalgo County. The hole was carried to 9180 feet and perforations were made 9148-55 feet with 20 shots. Here it tested dry and casing was perforated at 9008-15 feet with 24 shots. On a 3-hour drill stem test, there was a slight gas blow. It will test a series of gas and distillate sands above this level, being virtually certain to produce at some level below 8000 feet. If so, it will be the first pool in the district to produce below the 8000-foot level.

The importance of the depth is that it furthers a definite trend toward deep operations in the Rio Grande Valley sector of South Texas. Shell Petroleum Corporation uncovered 7600-foot production at La Sal Viejo in Willacy County, while Union Sulphur Company established oil production at 7500 feet on the Mercedes block, Hidalgo County. Neither pool proved highly profitable. Several concerns have developed 7800-foot production in the La Blanca field east of Edinburg in Hidalgo County, but this field is practically shut in due to high gas/oil ratio. A number of other possibile deep structures have been indicated in this basin, hence each deep wildcat's showings are closely watched as a key to deep oil. Sand bodies are reasonably thick, but in most cases carry high gas pressure and distillate, with a relatively low per acre-foot recovery.

Two key deep tests were removed from the active list. Collins and Company's Guerra 1 in Starr County, but near the Hidalgo line, was stopped at 7009 feet, while Y & B Oil Company's Waite 1, southeast of the Samfordyce

field in Hidalgo County, was junked after drill pipe stuck at 6528 feet. It was in the Vicksburg at this level, projected to the upper Jackson.

Lowe & Ely may have a new shallow Cockfield pool on the east side of the Roma structure in Starr County. M. G. de Gonzales 1, in Share 17-B, Porcion 72, after drilling to 3020 feet has plugged back to test sand at 751-86 feet, as indicated by an electric formation logging device.

New North Sweden sand expected to cover big area

San Antonio.—North Sweden field, Duval County, gains further importance with a newly discovered oil zone in the Jackson formation giving promise of covering a reasonably large portion of the field. Several days ago, a sand at 4500 feet, about 200 feet above the first regular pay, showed considerable oil on drill-stem test. Since that time all wells in the southwestern portion of the pool have been carefully coring at this level and a number of them have showed enough oil on drill-stem test to indicate commercial producers. Offsetting obligations have prevented any completions thus far, but it is likely that drilling of multiple wells will include this zone.

Of particular interest is that the field displays a number of sand lenses closing to the west and thickening to the east. Now, it appears that additional lenses may be expected on this large structure. At this time it is known that sands are located at 3900, 3950, 4300, 4500, 4700, 4750, 4800 and 5400 feet in the Jackson series. Likewise, salt water sands encountered in the Yegua in several wells not well located on the structure, suggest that this zone, too, will be productive. All of the fields along this trend show at least gas in the Frio sands and possibly will be the source of minor oil production.

Frank J. Gravis' Vaello A-1, just northeast of the field, was making a gauge from a sand in the Cole series, likely just above the regular zone. Casing was perforated at 3965-72 feet and flowed several million cubic feet of gas, spraying a barrel or two of distillate per hour through ¼-inch choke and showing a working pressure of 1600 pounds.

Another portion of the Mirando district was holding considerable attention. It is the Killam-Oilton sector, Webb County, being tied together in one comparatively large producing area. The field is unusually attractive to independent operators due to the fact that the sands are found at 1800 to 2000 feet, making inexpensive drilling and operation. The wells are not large, but the return on the investment is favorable.

In the Las Animas field, Jim Hogg County, Darby Petroleum Company completed an excellent producer in the first oil well for the field. Holbein 2-B flowed 106 barrels in 12 hours through ⅜-inch choke under tubing pressure of 150 pounds and casing pressure of 390 pounds. Casing was perforated at 1819-22 feet, which is in the Cole sand.

Matagorda County wildcat shows for producer.

* * *

Palacios well blows out from new production level.

Houston.—Another oil field in the Texas Gulf Coast may result from Pierce Estate's Fee 1, north of Van Vleck, Matagorda County. Oil sand was logged in Marginulina formation last week. Sand showing oil was encountered at 6626 to 6632 feet, limy shale with an oil odor was topped at 6632 to 6639 feet, and a sandy shale with a slight salty taste was logged from 6639 to 6641 feet. At the end of the week it was drilling below 7000 feet.

If Pierce Estate's Fee 1 opens a new oil field it will make the fourth field to be discovered on the Pierce Estate land in Matagorda and Wharton counties. The first was at Pickett Ridge, then Withers, Five Corners, and now the present wildcat.

In the Cheek area, Jefferson County, Glenn H. McCarthy took a drill-stem test on Broussard Hebert 1, C. Hillibrandt Survey, and showed oil and salt water. Casing was perforated with 10 holes from 7730 to 7732 feet and a 10-minute drill stem test showed 1750 feet of pipe line oil, 275 feet of salt water, 50 feet of sand, and a 100-pound pressure through ¼-inch chokes on top and bottom of the testing tools. Plans are to squeeze perforations from 7730 to 7732 feet and perforate a little higher for another test. This is the second time Broussard Hebert 1 has shown oil on drill stem tests and it no doubt will open another new oil field.

Humble Oil & Refining Company abandoned another "6500-foot" core test north of Nome, B. B. B. & C. Section 397. J. R. Blanch 1 was cored to 6530 feet and plugged.

Drilling in Gulf

The first well to be drilled offshore of the Texas Gulf Coast in the Gulf of Mexico is J. E. Harwell's State 1, southeast of the new McFaddin field, Jefferson County. The well is reported to have set conductor pipe.

Sun Oil Company's Bayshore 1, south of production at Palacious, L. Goodwin Survey, Matagorda County, blew out last week after casing was perforated with 40 shots from 9240 to 9275 feet. The well caught fire and was burning at the end of the week. Preparations were underway to make a drill-stem test of perforations and when all but 26 stands were out of the hole the well started kicking and blowout preventors were closed. Pressures increased to 5500 pounds and the crew started bleeding off the pressure and a nipple started leaking and after fighting the well for two days it got out of control. It is making gas, oil, and salt water, and operators will shoot the flame after all debris is removed. This well was drilled to 11,317 feet and three strings of casing were set, surface, 9⅝-inch at 8749 feet, and 7-inch at the bottom. The hole was plugged back and several tests made. The 9240-foot sand is a new level for the field.

South of Blue Ridge field, Medford & Burke's M. T. Woods 1, Magnolia Place Subdivision, Fort Bend County, was drilling below 5765 feet after logging salt water sands from 5708 to 5718 feet and from 5758 to 5760 feet.

Old Ocean Extended Southeast

Old Ocean, Brazoria County, was extended 3500 feet southeast last week by Harrison & Abercrombie's Copland 1, C. Breen Survey. The extension was completed in Frio sands at 10,660 to 10,677 feet after casing had been perforated with 36 holes. It made 307 barrels of pipe line oil daily through various size chokes with a tubing pressure of 3700 pounds. Casing was sealed. Copland 1 was drilled to 11,130 feet and 7-inch casing set at 10,300 feet, then a short string of 5-inch was run to 11,090 feet. Attempted completion at 11,020 to 11,030 feet had salt water. This is the first well at Old Ocean to show salt water below 10,000 feet. Fourteen hundred feet northwest of production at Old Ocean, Harrison & Abercrombie was preparing to complete Fee 2. It was drilled to 10,856 feet and 7-inch casing was set at 10,825 feet. Cement plugs were being drilled at the end of the week and casing will be perforated.

New Deep Sand Discovered at West Columbia

A new deep sand was discovered at West Columbia field, Brazoria County, last week by Sterling Oil & Refining Company. Smith 1, Geo. Tennillee Survey, came in flowing 642 barrels of pipe line oil daily through ¼-inch choke. Tubing and casing pressure was 840 pounds. Flow is from Frio sands at 5900 to 5913 feet, and 7-inch casing is set at 5899 feet.

Rowan Drilling Company and Shell Petroleum Corporation are preparing to make a test on Jamison 3 at Danbury, Brazoria County. It was cored to 1960 feet in sand showing oil after logging top of the sand at 1946 feet. Seven-inch casing has been set on top of the sand.

In the Battleground area, Harris County, W. S. Howell announced location for Root 1. It is 4370 feet north of the south line and 9100 feet east of the west line of the Arthur McCormick Survey.

The first blowout for Friendswood, Har-

ris County, was reported last week when Humble Oil & Refining Company's Pierce 1, W. K. Smith Survey, blew out at 3847 feet. The well blew for 15 miutes and then bridged after making mud and gas. This is a new gas sand for the field. Two completions were reported at Friendswood, Ross 1 made 620 barrels daily at 6015 feet and Beamer 4 was completed for 26 barrels per hour at 6050 feet.

Fairbanks May Be Extended Northeast

Fairbanks, Harris County, may be extended 2½ miles northeast by Amerada Petroleum Corporation and Stanolind Oil & Gas Company's Mills 1, A. Larson Survey. At the end of the week it cored oil sand from 6834 to 6863 feet with a few streaks of shale. This is the largest body of sand cored at Fairbanks. More core will be taken before setting pipe for a production test.

Stanolind Oil & Gas Company has cored oil sand in Moody 1, Clinton area, Reels and Trobough Survey, Harris County. Sand was logged from 3600 to 3622 feet and broken formation was cored at 3590 to 3600 feet. Casing will be set for a production test.

TEXAS GULF COAST Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
AMELIA—		
Humble, Phelan 12	*	lcn.
ANAHUAC—		
Humble, Clark 18	672	7085
Johnson 17	¶3½	6970
Zappe 11-S	696	7085
BOLING—		
Mack Hank Oil Co., Farmer C-7	105	4522
CALL—		
Houston Oil Co., Sabine Tram 3	*	lcn.
CLAY CREEK—		
Sun, Draeger 7	*	7005
DICKINSON—		
Atlantic, Jones 1	408	8112
J. K. Hughes, Echret 1	¶4	9085
FAIRBANKS—		
Amerada-Stanolind, Dopslauf B-1	80	6829
FRIENDSWOOD—		
Humble, Beamer 4	624	6050
Ross 1	620	6015
HARDIN—		
Gulf, Hinson 1	560	7633
Strake, Finley 3	96	7536
HASTINGS—		
Humble, Beers D-6	665	6070
McDeed 4	648	6080
J. Simmons, Alexander 2	649	6085
Stanolind, Brown 3	576	5910
Shaw 13	435	5620
HULL—		
Hamil & Smith, Barrow 2	60	5126
LOCHRIDGE—		
Gulf, Great Southern Life Insurance 1-A	*	9684
MAGNET—		
Humble, Cockburn 4	12	5542
Texas Crusader, Cockburn 5	99	5545
MANVEL—		
Texas Co., Houston Oil Field Association 31	574	5680
OLD OCEAN—		
Harrison & Abercrombie, Copland 1, dr to 11,130 ft, pb and comp	307	10,670
ORCHARD—		
Gulf, Moore 53	*	10,085
Moore 55	*	4566
PIERCE JUNCTION—		
Roxie Oil Co., Higgings 2	75	4077
SARATOGA—		
Thompson & Harris, Richardson 1	*	2734
TOMBALL—		
Humble, Ashley 1	480	5569
WEST COLUMBIA—		
Sterling, Smith 1	642	5913
BRAZORIA COUNTY—		
Pure Oil Co., Smith 1, Peach Point area, S. F. Austin sur	*	7710
JEFFERSON COUNTY—		
Humble, Blanch 1-A, n of Nome, B.B.B&C. sur (core test)	*	6530
MADISON COUNTY—		
Fausett & Kyle, Cannon Heirs 1, nw of Madisonville, J. P. Phillips sur	*	1663

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTH LOUISIANA

Jefferson Davis Parish show may mean field.

* * *

Shallow sand at Charenton makes flowing well.

* * *

Wildcat drilling work resumed in several areas.

Lake Charles.—Woodlawn, Jefferson Davis Parish, may be the first oil field uncovered in South Louisiana in 1938. Union Sulphur Company's Calcasieu National Bank 1, Section 12-9s-8w, on a test last week after perforating casing with 18 holes from 8276 to 8281 feet, showed gas, distillate, and fresh water. Tubing pressure was 2900 pounds. A bottom-hole choke is being set to increase the flow of distillate. Shut-in pressure was 3100 pounds.

Humble Oil & Refining Company abandoned Stegall 1, Section 20-9s-5w, northwest of Welsh, Jefferson Davis Parish. Drilled to 9010 feet, an electrical logging device made the decision. This wildcat was the center of attraction at one time when oil sand was logged from 6989 to 7000 feet and three drill-stem tests were attempted. Later the well logged another sand with a slight show from 7494 to 7514 feet.

On the south flank of Welsh, Stanolind Oil & Gas Company announced location for W. B. Conover 1, 330 feet west and 660 feet north of the southeast corner of Section 20-9s-5w.

New Shallow Sand at Charenton

A new shallow oil sand was discovered at Charenton, St. Mary Parish, by Pan American Production Com-

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SHREVEPORT LOUISIANA

Lake Charles—Houma—Converse
New Iberia—Rodessa—Monroe
Cotton Valley—Greggton
Houston

pany's Veeder-Hunt 2. The well came in flowing 383 barrels of 34.2-gravity pipe line oil daily through a 9/32-inch choke with a tubing pressure of 250 pounds and a casing pressure of 770 pounds, from Miocene sands at 1902 feet. Sand showing oil was logged at 1868 to 1902 feet. This is the first commercial producer from the shallow sand. The company's H. Ecuir B-1 was the first well in the area to log this sand and failed to flow. Sand was topped at 1860 to 1910 feet. Pumping equipment was rigged up and it pumped only 5 barrels daily. The well is to be worked over to try and make it flow.

Wildcat Work Revived

Wildcat drilling in South Louisiana has started off on a large scale. Two new wildcat locations were announced last week and it is expected that four more will be announced the coming week. Those wildcats which were rigged up and shut down at the end of the year are now preparing to spud.

Louisiana Crusader Oil Company is starting a test on University Block in East Baton Rouge Parish; Peeler Brothers at Lawtell, in St. Landry Parish, Continental Oil Company at Scott, Lafayette Parish, and Humble Oil & Refining Company at Reeves, in Allen Parish. The two wildcats announced last week were by O. Phillips at Goodbee in St. Tammany Parish. He made location for Goodbee 1 and Stevenson 1 in Section 33-6s-10e.

At Timbalier Bay in Lafourche Parish, Gulf Oil Corporation is preparing to open a new oil field in PP 3 State. The operators were waiting on perforating gun at the end of the week to make a test of Miocene sands at 6964 feet. Casing was perforated last week from 6955 to 6963 feet with 18 shots and on a 7-minute drill-stem test the well showed 4680 feet of pipe line oil, 360 feet of salt water, and a 25-pound pressure through ¼- and ⅜-inch chokes. The perforations were squeezed with cement to shut off the salt water.

Amerada Petroleum Corporation and Louisiana Land & Exploration Company probably will not complete South Coast Corporation 1, Raceland area, Section 34-15s-19e, Lafourche Parish, until after the interest's St. Charles Land Company 1 is completed at Bayou Des Allemands. South Coast Corporation 1 was waiting on cement to set at 9003 feet. St. Charles Land Company 1 was taking side wall samples around 8700 feet after setting 7-inch casing at 7200 feet.

SOUTH LOUISIANA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BAY ST. ELAINE—		
Texas Co., State 15	*	5939
CHARENTON—		
Pan American, Alleman A-1	*	3008
Veeder Hunt 2	383	1902
J. P. Scranton, Paul Le Blanc 1	*	2979
DOG LAKE—		
Texas Co., State 18	*	7275
JENNINGS—		
Glassel, Trushell 4	550	6998
O'Mera Brothers, Moresi 1	804	7054
LAFITTE—		
Texas Co., Rigoletts 8	1575	10,094
NEW IBERIA—		
Canal Oil Co., Bernard 9	*	5545
Texas Co., Hanszen B-9	312	5199
NORTH CROWLEY—		
Humble, H. J. Habetz 1	768	8148
M. Habetz 1	*	10,040
POTASH—		
Humble, Orleans Levee Board 16	*	1505
Orleans Levee Board 19	*	1348
Orleans Levee Board 25	*	1283
Orleans Levee Board 27	*	1055
Orleans Levee Board 28	*	713
Orleans Levee Board 30	*	583
ROANOKE—		
Humble, Thomas 1 (wo)	172	8660
WEST HACKBERRY—		
Stanolind, Gulf Land 27	*	4075
Lacey 4	*	lcn.
CALCASIEU PARISH—		
D & D Oil Co., Lutcher Moore 2, Northwest Starks, 1-8s-13w	*	9674
Republic Prod. Co., Sabine Tram 1, w of Starks, 25-8s-14w	*	9620
JEFFERSON DAVIS PARISH—		
Humble, Stegall 1, nw of Welsh, 20-9s-5w	*	9010

*Failures; †Junked; ¶Million cu. ft. gas.

Third Producer at North Crowley

The third producer to be completed at North Crowley, Acadia Parish, was Humble Oil & Refining Company's H. J. Habetz 1, Section 45-8s-1e, drilled to 8148 feet. The well came in flowing 519 barrels in 16 hours through a ¼-inch choke, with a tubing pressure of 1300 pounds. The 36-gravity oil was coming from Oligocene sands from 8138 to 8148 feet. Seven-inch casing was set at 8134 feet. Southeast of production at North Crowley, the company abandoned M. Habetz 1, Section 3-9s-1e, at 10,040 feet, after running electrical log.

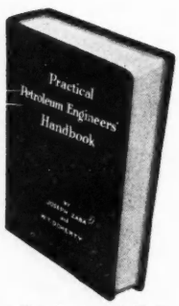
West of Starks, Calcasieu Parish, Republic Production Company abandoned Sabine Tram 1, Section 25-8s-14w, at 9620 feet after sticking drill pipe. The wildcat logged a gas sand and tried to blow out at 9620 feet.

On the Midland prospect in Acadia Parish, Gulf Oil Corporation was preparing to core in Broussard 1, Section 49-10s-2w, below 9678 feet, where the well tried to blow out. Seven-inch casing was set at 9672 feet.

Shreveport. — Twenty-nine drilling permits were authorized last week by the minerals division, Louisiana Conservation Commission, of which 18 were for North Louisiana divided among the following parishes: Caddo, 5, including 1 for Rodessa; Caldwell, 1; Claiborne, 4, including 3 for Lisbon; DeSoto, 1; Franklin, 1; Grant, 1; LaSalle, 2; Lincoln, 1, in Lisbon; Red River, 1; and Sabine, 1. The 11 in South Louisiana were divided among the following parishes: Calcasieu, 3; Cameron, 3; Jefferson, 1; LaFourche, 1; Plaquemines, 1, and St. Martin, 2.

San Angelo, Texas.—Shell Petroleum Corporation has purchased Amtex Petroleum Corporation's H. L. McClintic A and B leases, located on the southwest edge of the McElroy-Church & Fields structure, Upton County, for a cash consideration of $250,000. Purchaser assumes $17,380 oil payment due Humble Oil & Refining Company. Properties consist of 320 acres, with 8 3000-foot pumpers prorated to 190 barrels daily. Weekly Oil Corporation drilled the first 2 wells, and sold same in March, 1935, to Amtex Petroleum Corporation for $52,500 cash, with $60,840 oil payment outstanding.

PRACTICAL PETROLEUM ENGINEERS' HANDBOOK



By JOSEPH ZABA, E. M. M. Sc.
Petroleum Engineer, Rio Bravo Oil Company
and
W. T. DOHERTY
Division Superintendent, Humble Oil & Refining Company

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TABLE OF CONTENTS

Chapter I — General Engineering Data
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Chapter VI — Production
Chapter VII — Transportation

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NORTH LOUISIANA

Lisbon off for good new year start.

* * *

Weather and roads hamper field work.

Shreveport.—Six new wells were completed last week in the basal Glen Rose lime field at Lisbon to set that area off to an active start for 1938. There are 18 active operations under way there at present and 6 new locations were announced in addition to these.

None of the wells extended production. Although 2 outside tests were staked to the east and southeast, expansion largely continues by the one-location method due to the belief that many hold that Lisbon is the stratigraphic trap type field, this trap being formed by the reservoir rocks losing their permeability.

Rodessa added only 7 wells to boost its total of producers to 887 on the 3 sides of the fields in as many states. Rains, high water and bad roads affected its activity as it did practically all fields in the entire Shreveport district. The northeast end of Rodessa that extends into Arkansas which has been dividing activity with the Marion County, Texas, end of the field was especially affected. Cotton Valley, Webster Parish, was also hampered in drilling by high water at several locations.

Curative work has delayed testing of E. T. Oakes, H. D. Easton and associates' Griggs 1, C SW 36-18n-1w, Lincoln Parish wildcat, that showed good resistivity and porosity in basal Glen Rose lime at 5932-41 feet. Five and one half-inch casing was cemented at 6121 feet; total depth is 6260 feet in Travis Peak shale.

The first well completed in several years in the Dolet Hills south offshoot of the Bull Bayou field, DeSoto Parish, was completed last week by Petroleum Heat & Power Company in Kavanaugh 1, Section 7-11n-11w, at 2845 feet flowing 105 barrels in 24 hours through ¼-inch tubing choke. Gravity was 43.8 corrected. Seven-inch casing set at 2830 feet failed to hold and an attempted re-cementing job was not a success. Tubing with packer was then set and the well completed.

Gulf Oil Corporation's Goodpine Oil Company 1, SE SW 25-14n-8w, Bienville Parish wildcat, in which Petitt (basal Glen Rose) is reported to be missing, was coring at 6887 feet in black shale with streaks of lime.

Standard Oil Company of Louisiana and associates' Brownfield 2, C SE NW 5-19n-5w, which topped lower Marine at 7860 feet, with elevation of 235 feet, was coring at 8696 feet in sand.

First test of a proposed 10-well program on a 122-acre tract in the old Pine Island field, Caddo Parish, was spudded last week by J. F. Mitchell of Rodessa in Muslow 1, Section 31-21n-15w. They will be chalk and Tokio tests.

The old Pine Island area has been the scene of considerable shallow drilling in recent months due to the fact that not only can good stripper production be secured but also several good flowing wells in both the chalk and Tokio have been completed. The field is not prorated nor hampered by spacing rules. Operators in fields that are tightly prorated to a small per-well yield have been coming to Pine Island more and more for this shallow exploration.

Furthermore, it is known that Stanolind Oil & Gas Company who assembled a block of 9500 acres in and around this field, plans to drill a 7000-foot or deeper test during 1938. Structurally Pine Island is 2000 feet higher on top of the anyhdrite than Rodessa.

Second in Travis Peak

The Second Travis Peak oil well for Cotton Valley, Webster Parish, loomed Friday at W. G. Ray Drilling Company's E. L. Stewart 1, SE NW 33-21n-10w, which was in course of completion from 5807 feet after logging saturated formation from 5791 to 5807 feet. Nine and five-eighths inch casing was cemented at 5780 feet. Elevation is 247 feet. This is over 2 miles southwest of the other Travis Peak oil producer, Ohio Oil Company's R. L. Holloway 6, NE SW 23-21n-10w, and ¾-mile north of Standard Oil Company's E. L. Stewart 1, SE SE 32-21n-10w southwest Lower Marine outpost producer.

Shreveport.—Prairie River Syndicate's lower Marine wildcat test, Hutchinson 1, SW NW 15-15n-12w, Caddo Parish, has been plugged and abandoned at 9141 feet, plans to deepen having been abandoned. With elevation of 153 feet, this test topped lower Marine at 8380 feet and topped the Bodcaw sand of that formation at 8775 feet, logging several showings of gas and distillate, the best of which was tested at 8987 to 9110 feet.

NORTH LOUISIANA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CLAIBORNE PARISH (Lisbon)—		
Atlantic, J. T. Bean B-1, 32-21n-4w	1368	5210
Gulf, Patton 2, 32-21n-4w	1600	5289
T. L. James & Co., Tanner 1, 32-21n-4w	500	5250
Tanner 2, 32-21n-4w	1144	5252
Vaughn & Marr, King 2, 30-21n-4w.	780	5135
CADDO PARISH (Rodessa)—		
F. W. Burford, Terry 2, 2-23n-16w..	400	6025
DESOTO PARISH (Naborton)—		
Petroleum H&P Co., Kavanaugh 1, 7-11n-11w	105	2734
LINCOLN PARISH (Lisbon)—		
Love et al, Patton 1, 6-20n-4w	1680	5305
CADDO PARISH (Rodessa)—		
F. W. Burford, Cleveland 1, 2-23n-16w	700	5985

*Failures; †Junked; ¶Million cu. ft. gas.

ARKANSAS FIELDS

Ninth producer extends Schuler half-mile south

El Dorado, Ark.—The lower Marine producing limits of the Schuler field, Union County, were extended a half-mile south last week when Lion Oil Refining Company's Justiss A-1, NE NW NE 19-18-17, was completed flowing 86 barrels per hour through ½-inch tubing choke after 7-inch casing cemented on bottom was perforated at 7530-65 feet; elevation is 226 feet. This gave the Lower Marine horizon at Schuler its ninth producing well. There is one Permian lime gas-distillate producer there.

Four new locations were announced for Schuler, most interesting of which was one by Texas Canadian Oil Company in Section 22-18-17, a mile east of production.

Effective January 1 the proration order for Schuler went into effect limiting the per-well yield to 400 barrels daily.

Seven-inch casing was cemented last week in Lion Oil Refining Company and associates' Morgan C-1, NE SE SE 18-18-17, which was bottomed at 7589 feet. Top of the sand was 7516 feet, and in Phillips Petroleum Company's Jennings 1, NW SW NE 18-18-17, bottomed at 7702 feet.

A. H. Tarver was preparing last week to plug back and cement casing at 1304 feet for a test of an oil showing in the Nacatosh sand in Dean 1, SW SE 16-14-19, Ouachita County 1½ miles east of production in the shallow Troy field, Nevada County. The test, originally reported as planned for the Permian lime, was drilled to 2225 feet in Tokio but showed nothing in that horizon.

Two drilling permits were authorized last week by the Arkansas Board of Conservation, both deep tests in the Schuler field, Union County, and both issued to Marine Oil Company, as follows: M. D. Justiss 4, C Lot 7 NW 18-18s-17w, to drill to the Permian lime; and M. D. Justiss 3, 330 feet south and west NE Lot 7 NW 18-18s-17w, to drill to Jones (lower Marine) sand.

ARKANSAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MILLER COUNTY (Rodessa)—		
W. C. Feazel, Farmer 1, 13-20-28..	¶40	6090
W. L. McClanahan, Capps B-2, 12-20-28	400	6160
Thompson et al, Greer 1, 11-20-28..	720	6151
R. H. Long et al, Greer 2, 10-20-28	480	6141
UNION COUNTY (Schuler)—		
Lion, Morgan B-3, 18-18-17	3334	7670
M. Justiss A-1, 19-18-17	2250	7647

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTHEASTERN STATES

Mississippi hopeful of drilling venture

Jackson, Miss.—Total receipts from three gas wells drilled on a 1320-acre state-owned lease in the Hinds County part of the Jackson field for the first six months of 1937 was $16,089.38, according to a report submitted to the state legislature by the Mississippi State Mineral Lease Commission.

The legislature on March 26, 1936, appropriated $115,000 to be used by the mineral lease commission for drilling three gas wells and a deep test on the 1320-acre state lease. Of this amount all but $2785.72 has been disbursed or contracted for, the report stated. However, the disbursements included $27,000 for two gas wells contracted for on June 30, 1937, and not included in the three other gas wells or the deep test.

The deep test for oil went to 5529 feet and cost $45,750.51 according to the report filed. From that depth it was plugged back and although disappointing in volume was a small commercial well in the regular shallow gas horizon at 2400 feet.

The report concluded with this statement:

"The three wells now connected to the pipe line (United Gas) are averaging about $1000 per month income per well to the state. When the fourth well (the plugged-back well) is connected to the line and if the two wells now drilling (the two additional ones contracted for) result in producers, the state will have six wells with a monthly income of $5000 to $6000. By the end of the present biennium the state should receive approximately $75,000 income from these wells, and certainly in two years time the wells will have paid back the entire $115,000 appropriation."

Lamar County test sets Mississippi depth record

Jackson, Miss.—Sun Oil Company and associates' Talley 4, SE NW 33-4n-15w, Lamar County, fifth test on the salt dome discovered by them last January bids fair to set a new depth record for Mississippi, as it cored and drilled last week at 7850 feet in hard crystal sand with no showings reported. Drilling will continue for some time yet unless the salt dome flank is encountered or a showing appears.

The depth record of 8002 feet was set for Mississippi several years ago by a test drilled in Covington County, south Mississippi, shortly after discovery of the Jackson gas field.

Last week Southern Natural Gas Company had not announced location for its second test on the recently-discovered salt dome in Hinds County near Edwards, the dome being discovered in Section 35-6n-1w. However, definite information has been given that a second hole on the dome will be drilled.

In the same county, Black River Oil Company's (William C. Durant), Federal Land Bank 1, NE NE 11-15n-5e, was drilling a "tight" well but was reported in black shale at 5650 feet.

Phillips Petroleum Company's J. J. Newman Lumber Company 1, SE SE SW 21-2n-10w, was drilling hard shale at 5901 feet.

Shreveport.—Permit has been issued for the second salt water disposal well for the northeast part of the Louisiana side of the Rodessa field. The permit was issued to Lion Oil Refining Company to drill the well on its Wynn lease, Section 9-23n-15w, Caddo Parish. Several months ago Phillips Petroleum Company drilled the first such well in Rodessa on its Adams lease, Section 17-23n-15w.

Start deep test in Georgia

Atlanta.—The first deep test for oil ever to be drilled in the State of Georgia will be spudded some time early in 1938 by Pan American Production Company. The exact location has not yet been decided, but will be somewhere in the southeastern part of the state.

The preliminary surveys and the blocking of acreage for this test were handled with unusual quietness, probably due to the fact that Georgia is the forgotten state so far as oil is concerned. Geological reconnaissance was begun nearly two years ago. Little could be learned from surface mapping because Coastal Georgia is covered with a mantle of sand. Independent Prospecting Company of Houston did the initial magnetometer work, and this was followed by seismograph and core drilling. After magnetometer and seismograph work the companies sponsoring these investigations decided to block a large area in Wayne, Appling, Pierce and Coffee counties. These companies included Pan American, Adams Oil & Gas Company, and others. A large part of the acreage consists of partnership holdings, with the Pan American company owning 50 percent and operating control. Pan American has also taken several thousand acres on its own account.

ILLINOIS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CHRISTIAN COUNTY—		
Rogers Bros. et al, Johnson 1	*	3112
CLARK COUNTY—		
National Consumers Oil Co., Jackson 1	*	3122
FAYETTE COUNTY—		
Hausman et al (Adams Oil & Gas Co.), Northwestern Insurance 1	*	1733
JASPER COUNTY—		
Denver P&R Co., Ochs 1	*	3000
MARION COUNTY—		
Adams O&G Co., Merryman 16	55	1428
Merryman 17	69	1442
Frank Fredericks, Nattier 1	37	1460
Kirk D. Holland, Jennings 1	*	1460
RICHLAND COUNTY—		
Pure, Wilson 2	900	2950
Coen 3	316	2947
Coen 2	297	3000
Snyder 2	195	2971
Frost et al, Farris 1	215	3083
Hollingsworth, Inc., Wagner 1	*	3245
Kingwood Oil Co. & McMahon, Negley 1	*	3194
WAYNE COUNTY—		
Pure, Gill 1	300	3072
Gill 2	*	3082
Godlin & Hoffman, Riggs 1	*	....

*Failures; †Junked; ¶Million cu. ft. gas.

ILLINOIS DEVELOPMENTS

Wildcat activity in Coal Basin area commands attention

Olney, Ill.—Wildcat activity in the Southern and Western portions of the central coal basin area commanded attention last week. Markham, Mason & Redwine's Mitchell 1, Section 18-5s-3e, Ewing Township, Franklin County, found a deep run of sand, believed to be of the Cypress series, at 2470 feet and was preparing for a drill-stem test. Operators plan to drill to the McClosky formation, regardless of the test, and if the lower formation proves dry, will plug back.

Tate 1, Section 10-1s-2e, Rome Township, Jefferson County, drilled by Carter Oil Company to 3874 feet, had more gas when plugged back to 1990 feet than was good for pumping and was being allowed to flow by heads last week.

Carter Oil Company's Clow 1, Section 15-8n-3e, Louden Township, Fayette County, made 35 barrels of oil in three hours in the Benoist sand at 1508 feet. There was no water.

Show in Old Area

In Wabash County, near the Indiana line, where old wells have been producing for years from depths of 2000 feet and less, Hayes & Myer reported an oil showing at 2575 feet at Willard 1, Section 25-1s-13w, Mt. Carmel Township. Located three miles west of Mt. Carmel, it is the first test in the area to go below 2000 feet.

Another Dry Hole

Another dry hole was added to Jasper County's growing list with abandonment of Denver Producing & Refining Company's Jacob Ochs 1, Section 33-6n-14w, Ste. Marie Township. Total depth was 3000 feet. It is the fourth completion, and also fourth dry hole recorded in this county since activity in the area started several months ago.

In Richland County, Frost et al's Farris 1, Section 18-3n-10e, Olney Township, gave 215 barrels in a 24-hour pumping test after acidizing last week. Located three miles south of here, it is to be offsetted by the same operators, by Standard Oil Company of Ohio and by Ohio Oil Company just as soon as weather conditions make it possible to get equipment to locations. Papoose Oil Company was fighting a sea of mud last week in an effort to move a rotary rig to the John Lynch location in Section 5-3n-10e, a mile west of here.

John H. Myers announced location for a Jefferson County test on Section 33-4s-4e, Moore Prairie Township, about 3½ miles southeast of a Benedum-Trees Oil Company test now coring in the Weiler formation, and 1¾ miles north of Washburn Petroleum Company's C. H. Neil 1 in Northern Township of Franklin County.

Illinois No Great Market Threat Despite Its Publicity

By JOHN C. ALBRIGHT

DUE to the activity in the Illinois Basin, and the publicity such work has received recently, many have been led to believe that the region may shortly become a controlling factor in the crude oil market. It is true that the area is ideally located, being close to large consuming centers, and that the state does not have any proration laws. But on the other hand, oil production is not exceeding 20,000 barrels daily. Moreover, many of the wells are showing water and the large initial yields have declined sharply.

The main developments in Central Illinois during 1937 centered around Cisne, Clay City and Noble. Pools found in this sector are expected to have an ultimate yield of over 100,000,000 barrels, according to the Illinois Geological Survey. New fields are still a distinct possibility in the territory, however.

While the above district lies only about 35 miles due west of the old Bridgeport area in Lawrence County where hundreds of wells were drilled 30 years ago, no comparison can be made with productivity per acre in these two areas. Bridgeport produces from several sands and shales, together with the McClosky, each having been profitable and none have been found below 2,000 feet. The formations that produce to the east of Noble begin in the Pennsylvanian, and, listed consecutively are as follows: Bridgeport, Buchanan, Kirkwood, Tracy and McClosky. If one should try to visualize the ultimate production in the new fields as equal to the old area, which has produced in some sections as much as 14,000 barrels per acre, the conclusions reached would be entirely out of proportions. No production of importance has been found in these upper formations in the wells drilled in Noble and Clay City. One or two isolated examples may be found where oil is being produced above the McClosky, as Pure Oil Company has a well in Clay City pool pumping oil from above the McClosky, and a well is now being operated between Noble and Clay City that is producing about 40 barrels of oil per day from the Tracey sandstone (Benoist in Patoka, and Bethel in Geological formations). Outside of these isolated instances, the upper formations have not indicated that production of consequence will be had in the new area. That these formations are present has been well established, but adequate structural conditions are apparently absent that has prevented the accumulation of oil in commercial quantities.

Old wells drilled in Lawrence County many years ago were carried through the five or six upper pay zones and penetrated the St. Genevieve which contained oolites, varying in vertical thickness, which was very productive. The thickness of this zone is not always an indicator of productiveness, as comparatively thin bedding has produced greater amounts of oil than thicker sections. Mylius[1] says that wells have been drilled in Lawrence County in earlier days that found only 15 to 18 inches of McClosky that produced more oil per well than others drilled into the Pennsylvanian above, and which penetrated from 30 to 100 feet of pay.

In the Clay City and Noble areas, the oolitic limestone is found varying in depth in the St. Genevieve, and with widely varying conditions of cementation. Because of this characteristic of the productive zone, each well drilled to date has been considered in part as a wildcat. Structure undoubtedly plays an important part in this area, but porosity is of much greater importance. Wells have been drilled on what was considered the peak of well defined structures that were dry. When Ohio Oil Company began Arbuthnot 1, NW NW NW 8-3n-9e, the location was made on the top of the structure as determined by the seismograph. On August 2, 1937, the plug was drilled and the well produced 1998 barrels of oil the first day. During the period of waiting for the cement to set around the oil string, Pure Oil Company began operations for three offsets, one to the north, one to the west, and one diagonally across in the corner of Section 6. This well, only a short distance from the Arbuthnot discovery well was dry. Both the north and west offsets were completed for very small producers. Along the section line to the east, wells have been brought in that varied all the way from dry holes to small producers. Pure Oil Company's Walters 3 was also a dry hole, but its Palmer-Taylor 2 started off as a large producer and has been a consistent flowing well.

Wells within the townsite of Noble vary greatly in initial production, some only make about 40 barrels flush, while others have been reported as flowing as much as 1500 barrels the first 24 hours. Due to the closely spaced locations in the Noble townsite pool, all wells drop rapidly from flowing condition to pumpers, and the first well drilled in the townsite, Southern Illinois Petroleum Company's Harry Allard 1, came in the last week of October for a flush production of 145 barrels, and by the middle of November was making 20 barrels daily on the pump. This well was curiously affected by a neighboring offset which was being brought in by running the casing swab, that each time the swab was pulled, a vacuum was formed in the McClosky

[1] Mylius, L. A. Bulletin No. 54, State Geological Survey, Urbana, Ill. Page 40.

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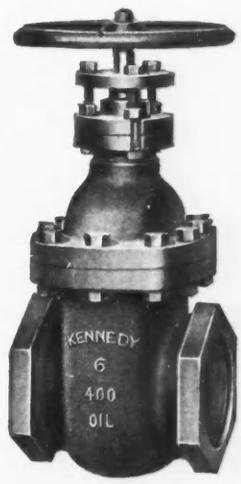

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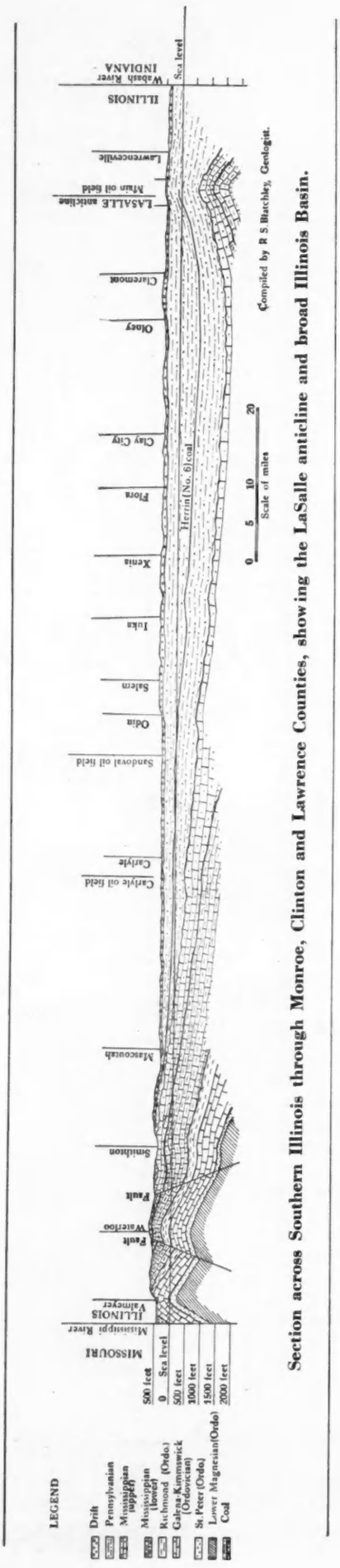

Section across Southern Illinois through Monroe, Clinton and Lawrence Counties, showing the LaSalle anticline and broad Illinois Basin.

and transmitted through the casing so no gas was produced for eight hours.

The thickness of the McClosky varies considerably in the townsite, having been cored with an average of about 4 feet. The oolitic section will average much thicker than this amount but highly cemented portions are invariably found that prevent the accumulation, and subsequent production of oil. Some wells in the area have cored thick sections of oolitic limestone, with bleeding cores removed from the barrel. These wells are considered almost valueless, as the pores release the trapped oil with difficulty. The most valuable cores, according to leading producers, are those that come from the barrel with no indication of oil in the rocks. The character of these desirable locations is such that the drilling fluid washes the oil from the core as it is being cut by the bit.

Whether the estimated, and hoped for in Illinois, 100,000,000 barrels of oil will be ultimately recovered from the McClosky limestone in The Illinois Basin, depends entirely upon the average that may be developed. With an average of less than eight feet of productive sand — and many wells have cored much thinner pay zones—and an average of 15 percent porosity, it is said, the amount of oil in place should not be difficult to determine, roughly. The amount of the oil in this reservoir that will be recovered by primary and secondary methods remains to be seen. Wells costing on an average of $25,000 each in this area, completed with derrick, drilling and tankage, may not have a large amount of differential between actual cost and gross yield.

The life of these wells may be long, as wells drilled in the Bridgeport area in Lawrence County many years ago are still profitable pumpers. However the initial cost, and subsequent operating expense of such wells will be much greater in Noble and Clay City than in the old fields, due principally to the difference in the depth. Wells in Bridgeport area averaged about 1900 feet when drilled, and wells in Clay City and Noble average 2950 feet. Again, the life of the new wells may be affected greatly by repeated acidizing, which not only will provide a much higher initial production, but may cause economic depletion to appear much sooner.

ILLINOIS STATE GEOLOGICAL SURVEY
Urbana, Illinois

OIL AND GAS PRODUCING STRATA IN ILLINOIS

System or Series	Formation*	Local Name and Area Productive
Pleistocene		Gas from glacial drift
Pennsylvanian	McLeansboro sh., ss., thin ls., and coal	Upper Siggins, "Gas," - Clark County fields
	Carbondale sh., ls., ss., coals	Casey, Claypool, Upper Partlow, Lower Siggins, "Bellair 500'" - Clark County Dykstra, Wilson - Marion County
	Pottsville ss., sh., thin coals	Lower Partlow - Clark County Robinson - Crawford County Bridgeport - Lawrence County Buchanan - Lawrence County Biehl & Jordan - Wabash County Petro - Marion County
Chester (Upper Mississippian) Series	Kinkaid ls., sh. Degonia ss. Clore ls., sh. Palestine ss. Menard ls., sh. Waltersburg ss. Vienna ls., sh. Tar Springs ss. Glen Dean ls., sh. Hardinsburg ss. Golconda ls., sh. Cypress ss. Paint Creek ls., sh. Bethel ss. Renault ls., sh., ss. Aux Vases ss.	Kirkwood - Lawrence County Carlyle - Clinton County Upper Lindley - Bond County Tracey - Lawrence County Benoist - Marion County
Lower Mississippian Series	Ste. Genevieve ls. St. Louis ls. Salem ls. Warsaw ls. Keokuk ls. Burlington ls. Fern Glen ls. Kinderhook sh., ls., ss.	McClosky sand - Wayne, Richland, Clay, and Lawrence counties Westfield lime - Clark County "Mississippi Lime" Carper sand - Clark County
Mississippian and Devonian	Chattanooga - New Albany sh.	
Devonian	Limestone	"Niagaran" Martinsville pool - Clark County "Hoing sand" Plymouth-Colmar field - McDonough County
Silurian	Dolomite	(Hunton limestone of Oklahoma)
Ordovician	Maquoketa sh. Kimmswick ls. Plattin ls. Joachim ls. St. Peter ss.	"Trenton" Martinsville pool - Clark County Dupo field - St. Clair County (Viola limestone of Oklahoma) (Wilcox sand of Oklahoma)

*ls. = limestone; ss. = sandstone; sh. = shale.

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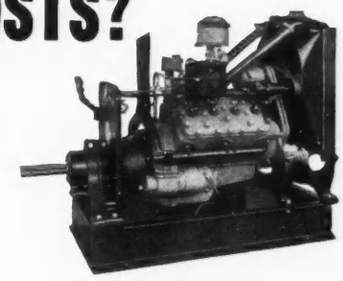

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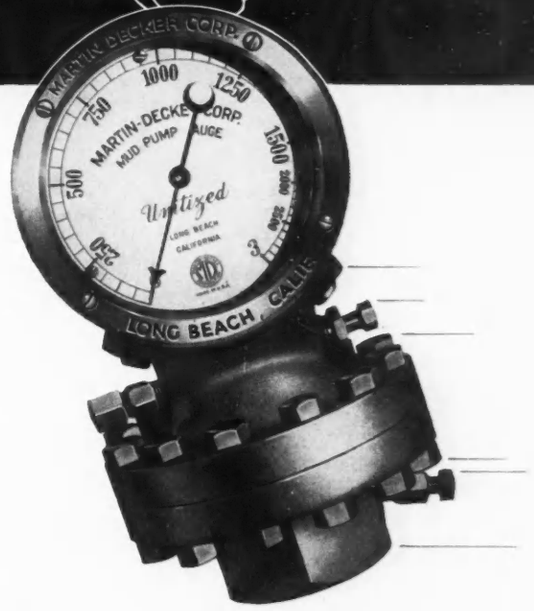

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Competitive drilling in store for Vacuum pool.

* * *

Eunice-Monument area well records prolific flow.

Hobbs, New Mexico.—Competitive drilling is in store for the Vacuum field, Lea County. Completion of Skelly Oil Company's State 1-J, east outpost, as a natural-flowing producer, necessitates the drilling of 4 offsets, and each of the latter will in turn call for offsets.

Skelly Oil Company's State 1-J, C NE NW 31-17s-35e, flowed 15 barrels hourly while cleaning out, and later gauged 126 barrels of 39 gravity oil daily through 12/64-inch choke, with 700 pounds pressure on casing and 150 pounds on tubing. First oil was logged at 4330-55 feet, and best saturation in Permian at 4530-40 feet. Hole is bottomed at 4545 feet, or 558 feet sub-sea. Magnolia Petroleum Company has made location for State 1-H, a west offset, and also for State 1-I, C NW SE 36-17s-34e, being an east offset to Phillips Petroleum Company's Hale 1. The latter logged top of anhydrite at 1305 feet, and was drilling at 2650 feet.

The Texas Company's State 1-M, west offset to the southernmost producer, was drilling at 4270 feet, and is slated to be the next completion. Magnolia Petroleum Company's State-Bridges 3 was drilling at 3900 feet.

Lea County is credited with 9 new projects, including a pair of wildcats to the east and southeast of the Langlie field. Harry W. Leonard et al's Ginsberg 1, C SW NW 29-25s-38e, is near the Texas border. Geo. F. Getty et al's Riggs 1, NW NW NW 1-26s-37e, is about 2½ miles southeast of the above prospect. Three undeveloped leases in the Penrose field are to receive their first tests. These include N. G. Penrose et al's Crosby 1, C NW NE 18-22s-37e, Gulf Oil Corporation's Mattern 1-D, C NE SW 6-22s-37e, and Shell Petroleum Corporation's Grizzell 1, C NW SE 8-22s-37e.

Eastland Oil Company et al's Waldrop-Shell 1, C SE SE 1-20s-38e, eastern Lea County wildcat, fulfilled depth contract in drilling to 4755 feet, and was abandoned. No water was encountered in the Big Lime, which was entered at a low structural depth.

Skelly Oil Company's Johns 1, C NW SW 21-24s-37e, near southwest edge of the Mattix field, flowed 330 barrels natural with 1,000,000 feet of gas from sandy lime at 3575 feet. Rushwold Oil Company's Mattix-Conoco 1, C SE NE 10-24s-37e, offset to the easternmost producer in the Mattix field, flowed 162 barrels of oil and 3 barrels of water in 4 hours after 300-quart shot at 3575-3625 feet. The oil tests 42 gravity.

West flank of the intersecting point for the Eunice and Monument areas recorded an unusually prolific well when Continental Oil Company et al's Reed 3-B-24, C E½ SW SW 24-20s-36e, averaged 87 barrels of 35-gravity oil hourly for 3 hours on ¾-inch choke after using 2000 gallons of acid at 3795-3868 feet.

NEW MEXICO Completions

Company, Well and Location	Init. Prod. BBls.	Depth
LEA COUNTY (Eunice)—		
Cities Service, Closson 8, c w½ ne ne 6-22s-36e	3600	3845
Closson 1-A, c ne ne 18-22-36e	4000	3814
Continental et al, Reed 3-B-24, c e½ sw sw 24-20s-36e	3000	3868
Shell, State 3-J, se se se 32-20s-37e.	150	3832
LEA COUNTY (Hardy)—		
Stanolind, Hill 1-B, lot 8, 6-21s-37e..	100	3810
LEA COUNTY (Langlie)—		
Herschbach Drl. Co.-Western Gas Co., Burleson 1, c e½ ne nw 8-25s-37e	350	3476
LEA COUNTY (Mattix)—		
Rushwold Oil Co., Mattix-Conoco 1, se ne 10-24s-37e	972	3625
Texas Co., Fristoe 2, nw ne ne 3-25s-37e	300	3481
Skelly, Johns 1, c nw sw 21-24s-37e.	330	3575
LEA COUNTY (Penrose)—		
Amerada, Corrigan 2, c s½ se se 4-22s-37e	500	3770

*Failures; †Junked; ¶Million cu. ft. gas.

Weather and price cut slow drilling activity.

* * *

Secord Township failure not to help development.

Mt. Pleasant, Mich.—Adverse weather conditions, holiday shutdowns and an uncertain price condition combined to slow up drilling activity in Michigan last week with only 7 completions in 2 counties recorded.

One of these completions was Archie M. Henry's State 1, Section 12-19n-1e, Secord Township, Gladwin County, 3 locations north and the same distance east of a 40-barrel Dundee discovery drilled two months ago in Section 11-19n-1e. State 1 indicated favorable structure on upper beds but was checked in at 3497 feet on the Dundee top or 8 feet lower than the discovery. It was bottomed out as a failure in salt water at 3497 feet.

Failure of this test will slow up the predicted play in the Secord district but little, according to most operators. It will, they pointed out, encourage development west and south of the producer in Section 11. A test has been spudded a mile west by Mammoth Oil Company and Sun Oil Company while offsets are being drilled on the north and east.

Two Appear Failures

Although not definitely abandoned, two other closely-watched wildcat tests appeared as Dundee lime failures early in the week. Daily Crude Oil Company's State 1, Section 29-15n-2e, Larkin Township, Midland County, is shut down at 3886 feet. Dundee top was checked at 3656 feet, with an earlier reported lime show either cased off 50 feet in the lime or having originated from one or more of the upper bed showings.

Charles Weller's Dewyer 1, Section 20-16n-3e, Garfield Township, Bay County, 6 miles southeast of the Bentley Township play in Gladwin County, reported big water in the Dundee at 3417 feet. Dundee top was checked at 3273 feet.

Interest farther down the Buckeye-Bentley trend developed this week when Gulf Oil Corporation checked the Dundee top at 2735 feet on Marston 1, Section 1-14n-4e, Monitor Township, Bay County. Gulf Oil Corporation has several thousand acres in the block, part of which was communitized due to Kawkawlin village. Structures show as much as 230 feet high on the current Dundee test. The area was carefully core tested prior to making the Marston 1 location, and if productive undoubtedly would influence future core testing programs in the state.

Dome Oil Company is shut down for orders on Lindgren 1, 33-25n-3w, Crawford County, 184 feet in the Dundee lime. The test may be carried down for a Monroe or Sylvania lime horizon test.

The 29-cent per barrel drop in crude prices for Ogemaw and Arenac County grades, affecting two sizeable fields, posted last week, has created a shaky condition in the market-price structure of other and bigger producing fields. The Ogemaw-Arenac grade price was lowered to 80 cents per barrel; causing a 47-cent differential against Midland grade and a 44-cent differential with Buckeye grade crudes.

Quality Influenced Price Cut

Inferior quality of crude produced in the Ogemaw and Arenac districts (both Dundee lime oils with an average 33 gravity but with a 250 to 310 pound to 1000-barrel salt content) and suspension of lake tanker service to both Buffalo and Toledo markets was cited as the chief cause of the drop.

Some operators in the two fields this week hoped to bring operators together to enforce a stiff voluntary proration program to force oil back to at least $1 per barrel. With crude from other fields in Central Michigan still available in quantities several thousand barrels above the daily market demand, effectiveness of the proposed plan was questioned by several leading operators.

MICHIGAN Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGAN COUNTY—		
Frank Vahue, tr, Chadbourn 1, sw se ne 28-2n-13w	*	1311
Robert Lentz, Hitzler 1, nw nw sw 34-4n-12w	*	1690
Regal Dutch Co., Hardy 4, nw sw se 16-4n-13w	550	1605
Muskegon Oil Co., Heasley 2, se sw ne 21-4n-13w	350	1555
Mich. Devonian, Huzinga 2, ne sw nw 22-4n-13w	185	1581
GLADWIN COUNTY—		
Archie M. Henry, State A-1, sw ne nw 12-19n-1e	*	3497
Rex O&G Co., Beacker 1, ne se sw 26-18n-1w	125	3592

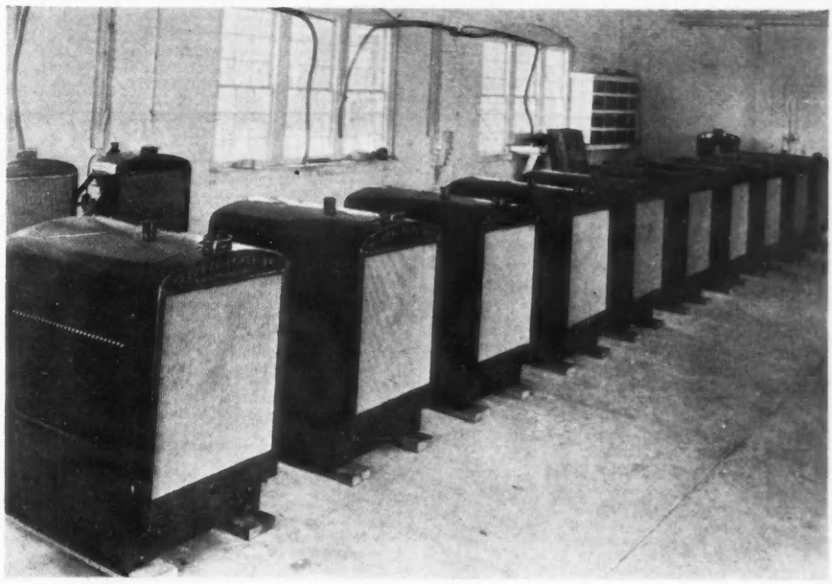
*Failures; †Junked; ¶Million cu. ft. gas.

EASTERN FIELDS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
OHIO		
ASHLAND COUNTY—		
Robinson et al, Moser 2	*	700
BELMONT COUNTY—		
Barnsville Dev. Co., Shry 1	*	1891
FAIRFIELD COUNTY—		
City Nat. Gas Works, McCready 1	¶.30	2300
J. A. Fisher 3	¶.04	2140
KNOX COUNTY—		
H. E. Perkins, Barnard	*	2550
MONROE COUNTY—		
Jims Run O&G Co., Dally 1	¶.18	1485
MORGAN COUNTY—		
Portage Prod., Inc., White 2	*	4270
MUSKINGUM COUNTY—		
Wittmer Gas Co., Bowden 1	¶.20	3880
PERRY COUNTY—		
Gas Prod. Co. of Ohio, Fleming 3	100	....
Kochler 2	10	3190
Kachelmacher Est. Davis	20	3640
SENECA COUNTY—		
Keller et al, Fravel 1	22	1479
STARK COUNTY—		
Obermiller et al, Sloan 1	¶.56	4515
TUSCARAWAS COUNTY—		
East Ohio Gas Co., Fuhrer 2	¶.30	4300
VINTON COUNTY—		
Kelch Bros., Hunt 4	¶.07	755
WASHINGTON COUNTY—		
Otto Heldman, Sparkling 4	¶	2095
WEST VIRGINIA		
BOONE COUNTY—		
Owens Ill. Glass Co., Allen & Pryor 1	¶.18	2300
BRAXTON COUNTY—		
Pittsburgh & W. Va. Gas Co., McCumbers 7636	¶.30	1740
J. E. Hall 7735	¶.07	1972
CABEL COUNTY—		
E. L. Lusher et al, S. Lemmings 1	¶.90	3553
CALHOUN COUNTY—		
Godfrey L. Cabot, Inc., Deem 1	¶.10	1965
KANAWHA COUNTY—		
Hays O&G Co., Humphreys 1	¶14.21	4904
W. Va. Gas Corp., Burgess 1	¶12.50	4841
Godfrey L. Cabot, Inc., Strasser 1	¶5.00	4894
G. B. Ray, Thaxton 1	¶1.25	4970
LINCOLN COUNTY—		
United F. G. Co., Huntington Gas Dev. Co. 4774	¶.26	3248
MONONGALIA COUNTY—		
Pittsburgh & W. Va. Gas Co., Core 5277	¶.05	3162
PLEASANTS COUNTY—		
Cooper Oil Co., Smith	*	1200
PUTNAM COUNTY—		
W. H. Kirtley, Billups 1	¶.26	2111
RITCHIE COUNTY—		
A. E. Dye, Dye	2	1750
R. C. Jackson, Mullenaux	1	2335
TYLER COUNTY—		
Britton & Cottrell, Parker	1	1553
A. S. McCullough, Wells 1	*	700
UPSHUR COUNTY—		
Cumberland & Alleghney Co., Winemiller 283	¶.07	3970
WAYNE COUNTY—		
Hamilton Gas Co., Wilson 1	¶.07	2943
WETZEL COUNTY—		
Manufacturers L&H Co., Goddard	*	2053
KENTUCKY		
BRECKENRIDGE COUNTY—		
Bryan & Patton, Patton 1	¶.15	380
DAVIESS COUNTY—		
Gibson & Anknay, Bryant 4	*	....
FLOYD COUNTY—		
Kentucky-W. Va. Gas Co., Woods 5229	¶.33	2652
HANCOCK COUNTY—		
C. D. Walker, Boling 4	50	400
Damron et al, Brown 5	¶.25	525
HENDERSON COUNTY—		
Wittmer Oil Co., Knight 1	10	724
KNOTT COUNTY—		
Inland Gas Co., Craft 194	¶.50	3160
McLEAN COUNTY—		
J. E. Ellis et al, Oberhausen 1	15	1390
Clark & Snyder, Stevens	¶.40	....
Kentucky Nat. Gas Co., Nall	¶.10	....
OHIO COUNTY—		
Nollem O&G Co., Coppage 1	*	640
PENNSYLVANIA		
GREENE COUNTY—		
Charles Mong et al, Metz 2	50	3250
WASHINGTON COUNTY—		
Union G&O Corp., VanKirk 8	30	3030
Citizens Water Co., Simpson 1	¶.04	2084

*Failures; †Junked; ¶Million cu. ft. gas.



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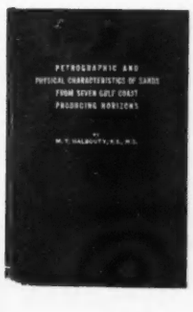

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IMPORTANT WILDCAT TESTS

MONTANA

CARBON COUNTY—R. C. Tarrant's Heare 1, cwl ne nw 14-6s-19e, dr 1490 ft.

FERGUS COUNTY—Whitetop Oil & Gas Co.'s 1, cne sw 35-14n-19e, sd 1450 ft.

YELLOWSTONE COUNTY — Broadview Dome Oil Co.'s Halbritter 1, ne ne sw 18-3n-23e, dr below 4147 ft with good oil shows reported. May acidize.

SOUTH DAKOTA

J. E. Polensky's 2, se sw 15-95n-64w, dr 3000 ft in lime and quartzite.

WYOMING

ALBANY COUNTY—Wyco Oil Co.'s Chappell 3, ne ne nw 23-21n-76w, sd 2540 ft for repairs.

FREMONT COUNTY—Stanolind Oil & Gas Co.'s Johnson 1, cse se 3-33n-96w, running dr stem test in upper Frontier at 6760-6930 ft.

HOT SPRINGS COUNTY — Delaware Oil Co.'s Skelton-Government 1, se se 2-43n-96w, dr 75 ft in lime.

NATRONA COUNTY—General Petroleum Corporation's Government 1, nw nw se 21-35n-77w, dr 4817 ft.

ILLINOIS

BOND COUNTY—Universal Wells Serv. Co. et al's Molder 1, nw nw nw 24-6n-4w, td 1914 ft; fsg core bbl. A. T. Whitehead et al's Pollan 1, nw se sw 26-6n-2w, sd at 2633 ft. W. C. McBride's Butler 1, nw sw se 30-4n-2w, mim.

CLAY COUNTY—Shelby O & G Co.'s (was Southern Ill. Pet. Co.'s) Knodacker 1, nw se sw 23-3n-7e, sd 2933 ft. C. H. & C. Oil Co. et al's Duff 1, cs½ nw ne 7-3n-8e, td 3075 ft, D&A. J. E. Milburn's Striegle 1, se nw ne 19-3n-8e, der. Bonnie Oil Co.'s Schnautz 1, se sw ne 31-4n-8e, cor 3036 ft. Vermillion Oil Co.'s Duff 1, cs/2 ne se ne 19-3n-8e, td 3046 ft; will swab. Wiser Oil Co. et al's Irwin Est. 1, cn/2 se nw 12-2n-7e, DST at 3066 ft. J. V. Wicklund's McCauley 1, "A", ne sw nw 7-2n-9e, der. Campbell et al's Walter Henderson 1, cn/2 ne ne 7-4n-7e, C & P. Carter Oil Co.'s Cox 1, ce/2 se sw 14-4n-5e, der.

CLINTON COUNTY—R. E. Dalton's Clifton 1, ne sw sw 15-1n-4w, sd 483 ft. Holley & Willis' Muex 1, ce/2 ne ne 18-3n-2w, td 1186 ft, D & A. Ellzy et al's Williams 1, sw nw sw 1-3n-1w, der. Schlosberg & Siegel's Monken 1, ne sw sw 4-2n-1w, td 1350 ft. Watkins & Wright's William Wise 1, nw nw se 24-1n-3w, mim.

COLES COUNTY—W. J. Miller et al's Tomberlin 1, se se se 21-11n-10e, spd & sd. Hughes' Swango 1, csw ne 27-13n-9e, sd 405 ft.

CUMBERLAND COUNTY—Jolly-Hill-Stipes et al's Jenkins 1, se ne ne 30-10n-9e, sd 2030 ft. Chas. Kapschuell's Oakley 1, sw ne sw 34-10n-8e, mi rot tools.

EDWARDS COUNTY—Cotton & Laller's Hays 1, ne ne ne 4-1s-10e, lcn.

EFFINGHAM COUNTY—Kingwood & Carter Oil Co.'s Bartel 1, ce/2 ne nw 26-6n-5e, td 4102 ft; testing. Samuel Hollis et al's Harrman 1, nw se sw 32-8n-6e, spd.

FAYETTE COUNTY—Carter Oil Co.'s Miller 1, cw/2 nw nw 12-8n-3e, td 3170 ft, to pb. John Farrely's (was Schroeder et al's) Lilly 1, se sw se 16-8n-3e, sd 1225 ft. Carter Oil Co's Clow 1, ce½ sw ne 15-8n-3e, td 1508 ft, POP. Wilson & Stokes' Fee 1, nw sw ne 14-8n-3e, lcn. W. B. Greer's Metzger 1, cn/2 ne nw 19-5n-2e, spd. Ryan & Redgraves' Jones 1, cs/2 ne 24-9n-1e, sd 193 ft.

FRANKLIN COUNTY—Robert Markham's Whittington 1, ce/2 sw se 18-5s-3e, dr 2200 ft. Washburn Pet. Corp.'s Neil 1, ce/2 se se 6-5s-4e, td 1618 ft, sd.

GREENE COUNTY—M. V. Yeager's Robinson 1, se sw nw 17-10n-11w, ru at 1375 ft.

HAMILTON COUNTY—Carpenter et al's Clark 1-A, nw nw sw 32-3s-5e, sd 1000 ft.

JASPER COUNTY—C. R. Obermeyer's Atkins 1, nw nw ne 3-6n-9e, sd for fuel oil. Denver P & R Co.'s Ochs 1, nw nw ne 33-6n-14w, sd 2800 ft. Hoffman et al's King 1, sw nw nw 20-8n-10e, sd 2835 ft.

JEFFERSON COUNTY—Siegel & Schlosberg's Schneider 1, ne ne se 15-1s-1e, sd 1035 ft. Carter Oil Co.'s Tate 1, cw/2 nw ne 10-1s-2e, pb to 1990 ft & POP. Sturbois & Tomberlin's Osborne 1, cnw se 8-2s-2e, der. Nollem & Benoist's Kelley 1, ne nw ne 25-4s-2e, td 1885 ft. Chas. Kapschuell's (was E. J. Dees & W. J. Carter's) Hamilton 1, ne sw nw 20-4s-3e, 225 ft oih; sd. Sturbois & Tomberlin's J. B. Morris 1, nw nw sw 6-2s-2e, der. Benedum & Trees' Arthur Owen 1, nw se sw 23-4s-3e, dr 2400 ft. Myers Bros.' Duckworth 1, ce/2 sw ne 33-4s-4e, mim.

JERSEY COUNTY—Boyd et al's Wyman 1, nw se nw 32-7n-12w, sd 930 ft.

MARION COUNTY—Siegel & Schlosberg's (was Dee & Nordan's) Roddy 1, sw se sw 20-2n-3e, fsg tools 2182 ft. Bonnie Oil Co.'s Daniels 1, cse/4 18-2n-4e, td 2801 ft, D & A. Marion Oil Co.'s Wilson 1, ne ne se 18-3n-3e, sd 1200 ft. Coleman-Blosser's Britt 1, nw nw nw 36-4n-1e, sd 1200 ft. Mahutske Oil Co.'s Nichols 1, se sw se 12-4n-4e, dr 2780 ft. Alexander et al's Pope 1, ne ne ne 26-3n-1w, sd 1472 ft. W. C. McBride's Clow 1, sw sw se 29-2n-1e, dr 830 ft. Helmerich & Payne's Stephens 1, sw sw sw 35-3n-4e, spd & sd. Evans et al's Morey 1, se se nw 4-4n-1e, mi

ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

*—*dry hole abandoned well.*	owdd—*old well drilling deeper.*
‡—*salt water (completions).*	owpb—*old well plugging back.*
†—*junked and abandoned.*	pb—*plugged back or plugging back.*
¶—*million feet of gas.*	r—*reaming.*
abd—*abandoned.*	rog—*rig on the ground.*
bbls—*barrels.*	rur—*rigging up rotary tools.*
br—*building rig.*	rust—*rigging up standard tools.*
b.s.—*basic sediment.*	sd—*shut down.*
csg—*casing.*	sdtr—*sidetracking.*
co—*cleaning out.*	sg—*show gas.*
dd—*drilling deeper.*	si—*shut in.*
dk—*derrick.*	so—*show oil.*
dr—*drilling.*	so&g—*show oil and gas.*
fsg—*fishing.*	spd—*spudding.*
ft—*feet.*	sr—*straight reaming.*
hfw—*hole full of water.*	sw—*salt water.*
in—*inches.*	td—*total depth.*
lcn—*location.*	ur—*underreaming.*
m—*milling.*	wih—*water in the hole.*
mim—*moving in materials.*	wo—*workover.*
mit—*moving in tools.*	wocs—*waiting on cement to set.*
mot—*milling on tools.*	wosr—*waiting on standard rig.*
n, s, e, w—*north, south, east, west.*	
oih—*oil in hole.*	

Record production from wells in South America

International Petroleum Company, Limited, reports record production from its Peruvian and Colombian wells during the past month. Total yield during October was 3,040,879 barrels, compared to 2,824,002 barrels during the previous month. Production during the first 10 months of this year from the company's holdings in Peru and Colombia totaled 28,984,133 barrels, a daily average of 95,342 barrels, compared to a daily average of 92,575 barrels during 1936.

mach. Schriver et al's Schreurer 1, se se ne 12-4n-1e, sdo 1600 ft.

MASSAC COUNTY—Kahle et al's Harvick 1, sw sw sw 23-14s-3e, td 2840 ft; sd.

MONTGOMERY COUNTY—Schlosberg & Siegel's Nieman 1, cse sw 29-8n-5w, sd 811 ft.

POPE COUNTY—C. C. Whitlock et al's Anthis 1, nw nw ne 12-11s-5e, sd 1352 ft.

RANDOLPH COUNTY—W. A. Delaney & J. E. Mabee's Wilson 1, ce/2 se ne 3-4s-5w, td 2860 ft; sd. Pioneer O & G Co.'s Hohnie 1, se nw nw 28-6s-6w, sd 552 ft.

RICHLAND COUNTY—Mammoth P & R Co.'s McCauley 1, sw se nw 28-3n-9e, co 3146 ft. Sam Raitman's Richey ,1 cne nw 12-4n-14w, lcn. Bill Loving et al's Blue Ridge Church 1, ne ne se 26-4n-9e, lcn abn. Ray & Alford's Franklin 1, nw nw ne 34-5n-10e, der. Frost's Farris 1, sw sw se 18-3n-10e, P 75 bbls oil, gross, 8 hrs. Parker et al's eBrry 1, se sw ne 22-2n-14w, spd & sd. Mammoth P & R Co.'s Brace 1, sw sw ne 28-3n-9e, P 140 bbls oil, comp. Papoose Oil Co.'s Lynch 1, cne nw ne 5-3n-10e, lcn. Bur-Kan Oil Co.'s Allen 1, csw nw 27-4n-10e, dr 705 ft.

SALINE COUNTY—Will Rogers et al's Saylor 1, se se se 3-10s-6e, sd 1125 ft. C. F. Bolton's Beagle 1, nw nw ne 13-9s-7e, sd 980 ft.

SCOTT COUNTY—Gregory & Mechling et al's Foltz 1, nw sw ne 31-14n-14w, td 1196 ft; sd.

SHELBY COUNTY—E. Breaseale et al's Richardson 1, cnw nw 35-12n-14w, spd 18 ft & sd. Ray Farrior's Fritz 1, ne ne ne 1-12n-2e, lcn.

WABASH COUNTY—Martin et al's W. R. Wood 1, ne se nw 31-1n-12w, dr 842 ft. Deck & Hays' Provident Mutual Life Ins. Co. 1, cse nw 25-1s-13w, dr 2428 ft.

WARDS COUNTY—Dr. W. F. Schmidt's Strenne 1, ne nw ne 5-1n-14w, spd & sd. Leach Bros.' Lee 1, sw ne se 11-1s-10e, ur 6-in csg 2979 ft. Harry Cotton's Leibke 1, ne ne sw 20-1n-14w, C & P. Cotton & Laller's Hays 1, ne ne ne 4-1n-10e, lcn.

WASHINGTON COUNTY—Silvers et al's Paul 1, nw nw se 29-3s-5w, spd & sd.

WAYNE COUNTY—Gordon et al's Taylor 1, cnw sw sw 15-1n-7e, mim. The Texas Co.'s Silverman 1, ce/2 sw nw 16-3s-7e, running 7-in csg.

WILLIAMSON COUNTY—Edward C. Snyder's Flemming 1, cse ne 9-10s-2e, mim.

NEBRASKA

JEFFERSON COUNTY—L. R. Page et al's Bonham 1, cse se 31-1n-1e, td 3304 ft, sd.

RICHARDSON COUNTY—Arab Pet. Corp. et al's Ogle 1, se se se 9-1n-14e, show free oil 2280-2300 ft, td 3423 ft, granite.

OKLAHOMA

ADAIR COUNTY — B. L. Maddox' Penn Mutual Life Ins. Co. 1, cs½ ne nw 5-16n-24e, dr 260 ft.

ATOKA COUNTY—C. M. Sheldon & Gardner Pet Co.'s Lee 1, ne nw sw 2-4s-10e, td 2034 ft, run 6-in csg.

BECKHAM COUNTY—Mid-American Oil Co.'s Biscoe 1-A, sw sw sw 28-8n-22w, dr 2341 ft.

BRYAN COUNTY—Southern Oil Co.'s Henry 1, cnw ne 10-8s-7e, rur tools.

CADDO COUNTY—I.T.I.O. Co.'s Dome-Bo 1, cne se 29-6n-10w, dr 6880 ft.

CARTER COUNTY—Lloyd & Noble's Revelle 1, sw sw se 21-3s-2w, td 4028 ft, sdo.

CLEVELAND COUNTY—Harper & Turner's Pollock 1, cw½ nw nw 13-9n-2w, woc 6807 ft. H. R. Hollenback et al's Mantooth 1, nw nw nw 24-6n-1e, C&P. W. A. Delaney et al's Bugher 1, se se sw 12-7n-2w, rot rig.

CHOCTAW COUNTY—V. K. Chapman & Lowe's Hallum 1, nw nw ne 4-7s-20e, sd 260 ft. J. A. True's Boby 1, nw se nw nw 17-7s-19e, dr 1784 ft.

COAL COUNTY—Carter Oil Co. et al's Claytor 1, cw½ ne sw 27-2n-9e, pb 6480 ft, to acidize Viola.

COMANCHE COUNTY — J. W. Wolfe's Costinus 1, sw sw se 30-4n-11w, spd. Frank Scott's Kuntz 1-A, se ne se 27-4n-11w, sd 2800 ft.

COTTON COUNTY—Bowers & Wise' Pendergraft 1, nw se sw 4-4s-12w, sd for rot tools.

CREEK COUNTY—M. W. Mosier et al's Holcomb 1, se sw ne 19-18n-8e, sd 3018 ft.

GARFIELD COUNTY—H. R. Hollenback et al's Clark 1, nw nw nw 34-21n-6w, dr 6634 ft.

GARVIN COUNTY—B. C. D. Edwards' Clark 1, ne ne ne 16-3n-3e, pb to 2088 ft, testing.

GRADY COUNTY—Gulf's Thomas 1, sw nw nw 14-4n-5w, dr 9505 ft. Doyle Pet. Co.'s Huffine 1, nw nw se 30-5n-8w, der.

GRANT COUNTY—Magnolia's Reynolds 1, ne ne se 19-25n-5w, fsg 5480 ft.

GREER COUNTY — J. I. Medlin et al's Broudie 1, nw nw nw 5-6n-20w, sd 90 ft. R. W.

McDonald's Fite 1, se se nw 34-7n-21w, cel. Gauntt & Baker's Parks 1, nw nw sw 29-7n-20w, dr 90 ft.

HUGHES COUNTY—Phillips' Becker 1, ne nw sw 8-5n-10e, cor 5710-14 ft. Pure's Rogers 1, se se ne 18-8n-12e, td 5054 ft, pb 3619 ft, ru cable tools. Homer Doup et al's Bank 1, ne ne nw 7-7n-9e, rust and sd. Kenneth Ellison et al's Metro Life 1, cne ne 14-7n-9e, dr 3545 ft.

JEFFERSON COUNTY—Massad & Swainsberger's Barrett 1, ne se se 14-6s-6w, sd 1890 ft. H. W. Weir et al's Hayes 1, se se nw 23-7s-7w, dk.

JOHNSTON COUNTY—Patton et al's McCrummens 1, sw sw ne 16-1s-6e, sd 1380 ft. W. T. Shelton's Chapman 1, cnw nw 26-4s-6e, sd 2510 ft.

KAY COUNTY—Fortuna Oil Co.'s Harris 1, sw sw ne 14-25n-1e, td 282 ft, temp. abd. E. J. Shaffer et al's McKee 1, ne ne nw 20-28n-1w, sd 2500 ft. F. S. Freeland et al's Watson 1-A, ne nw nw 28-28n-1w, dgng cel and rog. E. J. Shaffer et al's Rudolph 1, ne ne sw 27-29n-1w, cel. Clark C. Nye's Willin 1, se se sw 24-27n-4e, C&P. Helmerich & Payne's Scott 1, se se ne 20-28n-1w, dr 2545 ft.

KIOWA COUNTY—Hughes & Reese' Fultz 1, se se se 10-6n-18w, td 1238 ft, rep mach.

LOGAN COUNTY—Anthony & Marshall's Fruin-Eckman 1, se se sw 4-16n-1e, so&g, sd 5181 ft. The Texas Co.'s Roper 1, cw½ sw se 22-15n-1e, td 5542 ft, sdo.

LOVE COUNTY—Sinclair Prairie's Peabody Seating Co. 1, ne ne ne 35-6s-2w, lcn.

MAJOR COUNTY—Ed Parsons' Patzkowsky 1, cnw½ 10-20n-11w, rig.

MURRAY COUNTY—O. O. Owens' Gryer 1, ne se ne 34-1s-3e, dr 2685 ft.

MUSKOGEE COUNTY—F. E. Cusack's Elliott 1, cnl nw sw 20-15n-20e, rog. Cusack's Fee 1, ne sw se 20-15n-20e, spd 65 ft.

OKFUSKEE COUNTY—Mid-Continent's Inland 1, sw ne sw 10-13n-10e, dr 1385 ft. Broswood Oil Co.'s Lehman 1, nw sw nw 21-13n-10e, bldg rig.

OKLAHOMA COUNTY—W. O. Allen et al's Weaver 1, ce½ se nw 6-14n-3w, rur and sd.

PAYNE COUNTY—Mid-Continent et al's Ramsey 1, sw sw nw 18-18n-2e, set 7-in csg 4707 ft, wtg. Sagemore Drlg. Co.'s Moore 1, se sw nw 17-18n-1e, rig.

PONTOTOC COUNTY—Union Dev. Co.'s Abbott 1, sw nw ne 34-3n-6e, sd 3320 ft. H. W. Lee's Weatherly 1, nw se nw 24-1n-7e, rig. Riddles et al Fee 1, nw sw se 11-3n-5e, dr 2096 ft.

ROGER MILLS COUNTY — Central Pet. Corp.'s Lambe 1, se se se 27-14n-21w, rig corners and sd.

SEMINOLE COUNTY—J. F. Root's Cone 1, nw ne sw 17-7n-5e, lcn abd. H. V. Woodson & Marydun Oil Co.'s Gilliland 1, se se sw 24-11n-7e, sd 3713 ft.

STEPHENS COUNTY — Coline Oil Co.'s Johnson 1, sw se ne 1-2n-8w, dr outside 7-in csg 8687 ft. Clark & Cowden's Simpson 10, ne se ne 11-1n-5w, ru to dr out cem. Helmerich & Payne's (was Chas. Newsom) Pfile 1, sw sw sw 1-2s-7w, dr 3849 ft.

TEXAS COUNTY—Hagey et al's Peck 1, cne¼ 6-1n-13ecm, td 2842 ft, to cem off wtr.

TILLMAN COUNTY—Tom Walker's Bowman 1, sw sw nw 10-4s-17w, sd 200 ft. Caven et al's Southerland 1, sw sw nw 35-4s-16w, sd 44 ft. Smith's Hammell 2, ne nw nw 6-5s-15w, sd 1200 ft.

WASHITA COUNTY—L. B. McWhirter et al's Fee 1, nw sw sw 34-8n-19w, sd 1910 ft.

KANSAS

BARBER COUNTY—Palmer Oil Corp. et al's Warwick 1, cnw 29-31s-10w, ru and sd. Kansan Oil Corp.'s Mease 1, ne se se 27-30s-11w, td 4910 ft, wih. Pryor & Lockhart's Pickens 1, cwl e½ sw 34-30s-14w, dr 4715 ft. Helmerich & Payne's Winter 1, nw nw sw 16-32s-10w, dr 4025 ft.

BARTON COUNTY—C. L. Price et al's Hammeke 1, ne ne sw 12-18s-12w, bailing. Martin & Foraker et al's Dick 1, ne sw sw 31-19s-11w, mim. Shell Pet. Corp.'s Ehrlich 1, sw sw sw 1-16s-14w, dd to 3296 ft. 2800 ft oih. Ash et al's Frees 1, nw nw nw 34-16s-11w, dr 2585 ft. R. E. Day et al's Feltes 1, se se ne 14-16s-12w, sd 1775 ft. Shell Pet. Corp.'s Eckart 1, se se sw 13-16s-14w, dr 3414 ft. Thayer Drlg. & Brouk's Soderstrom 1, se se nw 21-17s-13w, dr 2405 ft. Sinclair Prairie Oil Co.'s Oeser 1, ne ne se 17-16s-11w, dr 800 ft.

BUTLER COUNTY — Reeves & Kinnan's Heim 1, sw sw sw 5-29s-3w, dr 2285 ft. Steinbushel et al's Fox 1, nw se ne 25-26s-3e, dr 1010 ft. T. S. Dustin's Miley 1, se nw ne 17-27s-5e, sd 395 ft.

CHASE COUNTY—T. D. Duffy's Leedy 1, ne nw nw 26-22s-9e, sd 50 ft.

CHAUTAUQUA COUNTY—Harrison et al's Brown 1, ne se ne 19-34s-10e, sd 820 ft. I. W. Siegle's Temple 1, sw sw sw 31-32s-12e, dr 400 ft. Sooby et al's Davis 1, sw ne nw 29-33s-10e, td 1019 ft, making 1 bbl oil per day.

CLARK COUNTY—Olson Oil Co.'s Lehman 1, se se sw 20-32s-21w, dr 4700 ft. Olson Oil Co. et al's Watkins 1, sw sw nw 23-32s-21w, dr 6423 ft.

COWLEY COUNTY—Smith & Price' Henderson 1, sw sw sw 25-32s-6e, dr 2970 ft. Earl Wakefield's Whitson 1, sw ne se 8-32s-4e, pb to 3292 ft. Dickey Oil Co.'s Kansas G. & E. Co. 1, ne ne ne 22-34s-3e, td 3277 ft, run 5-in csg. Roth & Faurot's Fry 1, nw sw sw 8-31s-3e, ur 8-in csg 1830 ft. Trees Oil & Talbott's McKinn 1, ne ne nw 16-31s-6e, dr 150 ft.

EDWARDS COUNTY—Douglas & Gear's Meade 1, se se nw 35-25s-16w, sdo.

ELLIS COUNTY—P. G. Reynolds et al's Karlin 1, nw nw nw 13-12s-18w, td 3675 ft, pulling 6 in csg. Skiles et al's Jensen 1, sw se ne 26-12s-18w, sd 2910 ft. Glimac Oil Co. et al's K. C. Life Ins. Co. 1, se sw nw 5-11s-18w, dr 2610 ft. Colonial Oil Co.'s Hadley 1, se ne se 5-11s-18w, brr. Bradley Oil Co.'s Jensen 1, nw nw se 36-11s-19w, show sulph wtr. C. L. Carlock's Heyle 1, se se nw 14-13s-16w, dr 2850 ft. Continental Oil Co.'s Baumrucker 1, ne ne sw 25-14s-16w, dr 3030 ft. Helmerich & Payne et al's Stebbins 1, nw nw se 7-13s-20w, dr 3598 ft. J. J. Muth's Penney 1, cnl ne se 29-14s-18w, co 350 ft. Watchorn O&G Co.'s Brown 1, ne ne se 34-13s-17w, aw/2000 gals, no increase. General Mach. & Tools Co.'s Jensen 1, sw se ne 26-12s-18w, dr 3570 ft. Witt & Sheridan et al's Hall 1, nw sw ne 1-12s-17w, lcn. Hays & Sackrider's Windholtz 1, ne ne ne 2-13s-16w, sd 40 ft.

ELLSWORTH COUNTY—Colonial Oil Co.'s Hogy 1, nw nw sw 16-16s-10w, set 10-in csg 1860 ft, co. Hinkle et al's Andrea 1, ne ne se 17-17s-10w, dr 3220 ft. Ralph Wixon et al's Peterman 1, sw sw sw 28-17s-10w, sd 1920 ft. Cities Service Oil Co. et al's Schroeder 1, cnl nw 29-17s-9w, rot rig.

GRAY COUNTY—P. G. Reynolds' Watkins 1, csw 32-28s-28w, rot rig.

GREENWOOD COUNTY — Whittaker & Johnson's Cannon 1, cel se nw 8-26s-13e, td 1504 ft, rng 5-in csg. John Nichols et al's Central Life Ins. Co. 1, sw sw se 35-25s-12e, spd and sd.

HARVEY COUNTY — Allison & Fitzwilliams et al's Hawk 1, se sw ne 16-24s-1w, dr 3560 ft. Nat'l Ref. Co.'s Brown Bros. 1, nw se ne 22-23s-2w, dr 1570 ft.

JACKSON COUNTY—Lemmick Oil Co.'s Marble Savings Bank 1, cne ne 26-9s-14e, sd 510 ft.

JEWELL COUNTY—Hollingsworth Bros.' Wolfe 1, nw sw se 14-4s-8w, spd and sd.

LANE COUNTY—Phillips Pet. Co.'s John Kees 1, cse se 3-19s-30w, dr 2545 ft.

MARION COUNTY—Tom Palmer et al's Matz 1, sw sw se 8-19s-1e, set 5-in csg 3354 ft, co.

McPHERSON COUNTY—Clyde Pulse et al's Boesker 1, se se nw 29-20s-1w, rig. Boyle & Grossman's Diener 1, se se ne 35-19s-1w, dr 3099 ft. Carter Oil Co.'s Hoglund 1, cw½ sw nw 8-17s-3w, dr 3507 ft. Phillips Pet. Co.'s Galle 1, nw nw ne 11-21s-2w, dr 3275 ft. Archer & Crane's Templin 1, nw sw se 32-17s-3w, co 1808 ft.

MEADE COUNTY—Pacific Mid-West Oil Co.'s Rexford 1, ne se sw 8-30s-29w, sd 900 ft. Barnett et al's Adams 1, sw sw ne 22-34s-30w, rot rig.

NESS COUNTY—Jones & Lane's Page Milling Co. 1, se se nw 36-18s-26w, fsg 3265 ft. Marshall Drlg. Co. et al's Anderson 1, sw sw nw 23-16s-24w, spd and sd. Trojan O&G Co.'s Moses 1, csw nw 10-18s-25w, sd 500 ft. Continental Oil Co.'s Olson 1, sw nw nw 5-18s-25w, td 4325 ft, swabbing.

PAWNEE COUNTY—Stanolind O&G Co. & Amerada Pet. Corp.'s Jantz 1, sw sw sw 25-20s-16w, pb 3812 ft, D&A.

PHILLIPS COUNTY—C. W. Davidson et al's Elliff 1, se ne ne 35-5s-18w, sd 575 ft.

PRATT COUNTY—Skelly Oil Co. et al's Adams 1, se nw ne 2-28s-11w, pb 4200 ft, aw 6000 gals, 23,700,000 cf gas. Helmerich & Payne et al's Hoeme 1, se se ne 20-26s-1w, dr 4249 ft. Ohio Oil Co.'s Howell 1, csw sw 21-29s-15w, dr 2445 ft.

RENO COUNTY—Sam Schneider et al's Kroecker 1, ne ne ne 12-22s-5w, dr 3977 ft. Street & Butler's Kincaid 1, ne ne nw 13-24s-4w, ru and sd. Carey et al's McPheeters 1, ne ne nw 22-26s-8w, dr 2295 ft. W. E. Witt et al's Fair 1, nw se se 4-22s-8w, P. 25 bbls oil, 8 hrs. Cohen et al's Teter 1, se se sw 3-23s-5w, ru and sd. Westgate-Greenland Oil Co. et al's Popp 1, sw sw ne 7-25s-4w, dr 4007 ft. McCole et al's Mathews 1, sw nw nw 15-24s-10w, spd 80 ft. Skelly, Kimmel & Stewart's Gorham 1, sw sw se 32-25s-10w, lcn.

RICE COUNTY—Skiles et al's Campbell 1, se se ne 28-19s-9w, co 3202 ft. Joe Aylward's Weihe 1, sw sw ne 23-18s-9w, set 10-in csg 1900 ft, co. Price et al's Gemeinhardt 1, ne ne se 18-18s-10w, dr 550 ft. Western Kansas' Bailey 1, sw sw nw 19-20s-6w, sd 129 ft.

ROOKS COUNTY—Producer Oil Co. et al's Ham 1, sw sw nw 25-7s-19w, sd 300 ft. Graham et al's Fike 1, sw sw sw 9-9s-17w, fsg. Witt & Sheridan et al's Morrison 1, nw se sw 29-10s-17w, rot rig. Elwell et al's Zimmerman 1, ne ne nw 15-9s-18w, brr. Colonial Oil et al's Hancock Life Ins. Co. 1, nw sw sw 21-10s-18w, rot rig.

RUSH COUNTY — Wakefield & Brouk's Kerbs 1, nw nw se 11-17s-16w, dr 3520 ft.

RUSSELL COUNTY—Emrichs et al's Anderson 1, ne se sw 33-15s-11w, spd and sd. Murfin & Vernon O&G Co.'s Pearson 1, ne ne ne 31-15s-15w, hfw 3480 ft, D&A. Jones & Shelbourne's Short 1, ne ne ne 12-15s-12w, dr 2810 ft. Phil-Han & Hinkle's Reinhardt 1, se se sw 19-14s-14w, td 3243 ft, ur 7-in csg. Shields et al's Rogg 1, nw nw sw 28-14s-13w, dr 1665 ft. Parks et al's Gorham Est. 1, sw nw ne 19-15s-15w, ru. Jones & Shelbourne et al's Kuhnle 1, se se nw 4-15s-12w, cel.

SEDGWICK COUNTY—I. W. Murfin et al's Martin 1, se se nw 18-28s-1e, swb 45 bbls oil, 24 hrs. W. C. Halbott et al's Downs Est. 1, se se nw 32-28s-2e, testing. Union O&R et al's Howell 1, sw sw sw 6-29s-1e, sd 2400 ft. Frank Hudson et al's Fulton 1, ne ne se 35-28s-1e, fsg 1550 ft. McKnabb et al's Garrett 1, se sw sw 18-29s-1e, sd 100 ft. Steinbuchel's Shaffer 1, sw sw nw 18-25s-1e, td 3685 ft, D&A. Steinbuchel et al's McAdams 1, sw sw ne 28-29s-1e, dr 250 ft.

STAFFORD COUNTY—Hinkle et al's Moses 1, nw nw sw 9-22s-13w, dr 2634 ft. Torry & Feaster et al's Heggy 1, ne ne sw 26-33s-11w, dr 250 ft. Torry & Feaster et al's Negley 1, sw sw ne 23-22s-12w, dr 692 ft. Lindsay & Bailiere et al's Tieperman 1, sw sw nw 31-22s-12w, dr 3663 ft. Cardinal Oil & Carraker et al's Sittner 1, sw sw sw 4-22s-12w, dr 1831 ft. Rust et al's Simms 1, nw nw sw 8-23s-11w, td 3729 ft, rust. Carter Oil Co.'s Andress 1, cnl se 2-21s-13w, lcn.

SUMNER COUNTY — W. M. McKnabb's Blair 1, sw sw sw 7-30s-1e, td 3869 ft, swabbing. Saco Oil & Cameron et al's Phipps 1, sw se ne 24-30s-1w, spd and sd. Hugh T. Jones et al's Stunkal 1, se se sw 2-30s-1w, rig. E. B. Shawver's Stewart 1, nw nw se 4-32s-3w, mim.

TREGO COUNTY—Carlock's Kinzel 1, sw sw sw 9-13s-22w, spd and sd. Manning & Martin et al's Lynd 1, nw nw sw 16-11s-21w, brr.

WOODSON COUNTY—Charles Reeser et al' Weide 1, nw nw se 18-25s-14e, sd 1150 ft.

CALIFORNIA

FRESNO COUNTY

JACALITOS CREEK—Dauphin Dev. Co.'s Boone 1, 20-21-14, td 3720 ft, flowing brackish sulphur water.

PANOCHE—J. A. Gautier's Hubbard 1, 12-14-11, sd 510 ft.

COALINGA—F. C. Grimes' No. 1, 12-20-15, lcn. John F. Wilcox's No. 6, 11-20-14, rig.

JACALITOS HILLS—Jacalitos Pet. Co.'s Associated 1, 14-21-15, td 5594 ft, to resume dr.

GUIJARRAL HILLS—Petroleum Sec. Co.'s Gatchell 2, 18-20-16, spud Dec. 30, dr shale.

HURON—Pure's S. P. 1, 31-18-17, dr shale 9860 ft.

CIERVO—Superior's No. 1, 20-16-13, dr shale 1784 ft.

TRANQUILITY—Union's Nicholson 1, 17-15-15, dr shale, streaks sand 5211 ft.

CANTUA CREEK—Western Gulf's S.P.L. 4, 3-17-15, woc 13⅜-in. 1885 ft.

KERN COUNTY

MIDWEST-SUNSET—American Empire Oil Co.'s No. 1, 20-31-24, rigged and idle.

DEVIL'S DEN—Amerada's Beer 5, 22-26-19, dr grad shale 5739 ft. Den Pet. Co.'s Bates 1, 20-25-19, sd 4716 ft.

FRUITVALE—Calif. Western Oil Co.'s K. C. L. 1, 14-29-27, dr shale 1560 ft. Pacific O&G Dev. Co.'s Fannuchi 1, 14-29-27, dr silty oil sand 2946 ft.

BELRIDGE AREA — Chico-Martinez Oil Co.'s Exeter 1, 1-29-20, dr shale 328 ft. Ohio's Ford 1, 6-29-22, sd 2027 ft.

WASCO—Continental's K.C.L. A-2, 8-27-24, dr gray sand 11,730 ft, to run formation tester, cemented 7-in 11,570 ft; K.C.L. B-1, 12-29-26, td 10,205 ft, redr at 9197 ft; K.C.L. D-1, 10-30-26, lcn. Seaboard-Tide Water Associated's Continental K.C.L. C-1, 26-27-24, sd 10,213 ft.

KERN FRONT—Deep Zone Oil Co.'s No. 2, 20-28-27, rig. Vernon & Wheeden's Robinson 1, 28-28-27, dr sand and shale 1976 ft.

ARVIN—General Pet. Corp.'s Houchin 1, 27-31-29, td 7928 ft, plug 7361 ft, produced 160 bbls 30 gravity oil, shut in; Pauley 1, 22-31-29, sd 500 ft; St. Helens 1, 12-28-20, dr shale 5850 ft. Petrex, Inc.'s No. 1, 32-31-30, sd 2100 ft.

McVAN—Golden Bear Oil Co.'s No. 1, 10-27-27, lcn. North American Oil Cons. Co.'s No. 1, 26-27-27, dr silty shale 3125 ft.

GRAPEVINE—Honolulu Oil Corp.'s 33-1, 33-12-19, dr sand and shale 5896 ft. Ohio's T.

R. C. D-2, 23-11-19, dr sand and shale 5350 ft. Petrol Corp.'s No. 1, 32-11-19, rigged and idle. Universal Cons. Oil Co.'s Tejon 1, 33-11-19, td 4450 ft, producing 40 bbls 23 gravity clean oil and 300,000 cu ft gas.

CALIENTE CREEK — Geo. W. Johnson's No. 1, 33-29-30, sd 750 ft.

ROUND MOUNTAIN—Richfield's Olcese 1, 17-28-29, rig. Shell's Olcese-Lilly 2, 21-28-29, spud Dec. 23, dr 750 ft.

McKITTRICK—Rocima Oil Co.'s No. 1, 20-30-22, dr brown shale 1763 ft.

MOUNTAIN VIEW—Section Six Oil Co.'s Johnston 1, 6-31-29, abn 7584 ft.

McFARLAND—Shell's Keystone 1, 4-26-27, spud Dec. 28, dr.

STRAND—Shell's K.C.L. A-72, 14-30-25, dr shale 7950 ft.

SAN EMIDIO—Shell's No. 4-26, 26-11-22, dr shale 4522 ft.

KERN RIVER—Sleeper Ridge Oil Corp.'s No. 1, 15-29-28, sd 1435 ft.

TEN SECTION—Standard's K.C.L. 15-1, 27-30-26, td 8070 ft, 9 in froze and cemented 6313 ft, to run 7-in.

SEMITROPIC—Standard's Randolph Comm. 2, 14-27-23, dr sandy shale 8304 ft.

GREELEY—Superior's K.C.L. 9, 3-30-26, td 7870 ft, pumping muddy water.

SO. MARICOPA—Texas Co.'s Pioneer 1, 33-11-23, dr shale 5962 ft.

MISCELLANEOUS

GLENN COUNTY—Ohio's Willard 1, 18-20-2, dr sandy shale 3891 ft.

HUMBOLDT COUNTY—Texas Co.'s Eureka 2, 22-3-1, td 7708 ft, plug 5737 ft, 700,000 cu ft gas.

KINGS COUNTY — Pyramid Prod. Co.'s Retherford 1, 27-24-18, td 1540 ft, r to straighten hole.

MERCED COUNTY—Amerada's Carano 1, 19-10-11, dr hard gray sand 7426 ft.

SAN JOAQUIN COUNTY—Standard's Weil-Zuckerman 1, 25-2-4, td 7070 ft, test showed muddy salt water, fair gas blow.

SAN MATEO COUNTY—Bergman Oil Co.'s No. 1, 10-6-5, lcn. Wilshire's Cowell 1, 20-6-5, dr shale 5980 ft, showing gas.

SOLANO COUNTY—Tracy Dr. Co.'s Hanson 2 (Rio Bravo), 36-4-2, td 4380 ft, 40,000,000 cu ft gas, shut in.

TULARE COUNTY—Magnet Oil Co.'s A. O. G. 3, 29-24-24, sd 7555 ft. Standard's Morris 1, 36-24-23, dr shale 11,253 ft. Si Wicker's No. 1, 1-24-27, lcn.

MONTEREY COUNTY—Amil A. Anderson's Hillman 1, 15-24-14, dr shale 3038 ft.

SAN LUIS OBISPO COUNTY—Ajax Pet. Co.'s No. 1, 27-26-13, rig. Cholame Synd.'s Jack 2, 10-25-15, sd 3641 ft. Little Cuyama Oil Co.'s No. 1, 3-10-26, td 3950 ft. Vanguard Oil Co.'s Clark 1, 26-27-14, sd 975 ft.

SANTA BARBARA COUNTY—E. C. Arnold's Arnold-Apache 2, 8-8-33, td 6370 ft, 50 bbls on pump, pulling tubing. Carpinteria Oil Co.'s No. 1, 34-4-2, rigged and idle. O. C. Field's Santa Rita 1, 11-7-33, td 3358 ft, co. Pima Oil Co.'s Morganti 1, 13-9-35, spud Dec. 16, dr shale 950 ft. Standard's Los Flores Land 1, 27-9-33, dr sand and shale 3148 ft. A. E. Tweedy's No. 1, 34-5-31, dr shale 576 ft. United Western Oil Co.'s No. 1, 16-7-30, sd 1032 ft. Wilshire's Hollister 1, 35-5-33, rigged and idle.

VENTURA COUNTY—Joint test (General Pet. Corp., Honolulu Oil, Richfield, Shell, Standard and Texas Co.), No. 1, 15-1-22, td 1038 ft, to resume dr. Oxnard Oil Co.'s Vanoni 1 (Oxnard), 10-1-22, td 6302 ft, ran 550 ft 6⅝ in blank liner, to gun perforate. Richfield's McFarland 1, 13-21 (Camarillo), dr shale 6960 ft. Texas Co.'s Rancho Santa Clara, Edwards 1, 13-3-21, dr shale 5625 ft.

SOUTHERN CALIFORNIA

WILMINGTON—Alford Dev. Co.'s Classif. Yards 1, 22-4-13, dr sand and shale 6143 ft.

PALMDALE — Antelope Valley Pet. Co.'s No. 1, 17-6-12, grading lcn.

NEWHALL—Barnsdall's Rancho S.F. 2, 26-4-17, dr oil sand streaks shale 6312 ft. West Coast Dev. Corp.'s Newhall Land 1, 27-4-16, dr hard shale 1320 ft.

PICO CANYON—Downey Oil Corp.'s No. 1, 36-4-17, sd 2550 ft.

PALOS VERDES—Hunter-Devlin & Associates' No. 1, 17-4-14, td 5502 ft, plug 4445 ft, to test 4295 to 4445 ft.

TICK CANYON—Mint Canyon Pet. Co.'s Jennings 1. 35-5-14, sd 734 ft.

MONTEREY PARK—W. E. Ramsey and Monte Cristo Oil Co.'s Bass-Good Knight 1, 27-1-12, td 2390 ft, redr 2226 ft.

PALOS VERDES HILLS — Rolling Hills Pet. Co.'s P.V.I. 27-4-14, dr shale 2350 ft.

CASTIAC — Royal Lands Corp.'s Ramona Hills 1, 8-4-17, dr red clay 331 ft.

GARDENA—Texas Co.'s Gardena Com. 1, 30-3-13, dr sandy gray shale 5393 ft.

SAN BERNARDINO COUNTY — Seligna Dr. & Prod. Co.'s Abercherli 1, 12-3-8, dr sandy shale, showing oil on ditch 1862 ft.

ALABAMA

GREENE COUNTY—Greene County Dev. Co.'s R. C. Lett 2, se nw 5-21n-2e, sd 115 ft.

HOUSTON COUNTY — Rice O&G Co.'s Oakley Est. 2, se nw sw 9-3n-29e, sd 4975 ft. Tuscaloosa.

MOBILE COUNTY—Grand Bayou O&G Co.'s J. A. Stafford 1, sw sw 24-7s-3w, lcn. J. C. Prine's King 2, ne ne 4-1n-4w, elev 135 ft, 10-in csg 300 ft, arr set 8-in csg, td 1100 ft (1100 ft s of No. 1).

FLORIDA

LAKE COUNTY—Oil Dev. Co. of Fla.'s Gulf Expl. Co. 2, se se 17-24s-25e, elev 120 ft, arr re-test 2600 ft, old td 6126 ft.

LEVY COUNTY—Fla. Oil Discovery Co.'s Sholtz 2, sw sw ne 9-15s-13e, sd repair draw works 2275 ft lime.

NASSAU COUNTY—St. Mary's River Oil Corp.'s Hilliard Turpentine Co. 1, nw ne se 19-4n-24e, elev 110 ft, dr 3895 ft gray sticky shale.

SUWANEE COUNTY—Wm. G. Blanchard's Lucy Cotton 1, se ne 35-3s-11e, elev 70 ft, 16-in csg 190 ft, sd for heavier rig, td 200 ft.

ARKANSAS

COLUMBIA COUNTY—Kerrlyn Oil Co.'s Barnett 1, sw ne 14-17-20, owdd, td 6314 ft. Standard of La.'s D. E. Thomas 1, nw se 8-16-22, lcn; Bodcaw Lbr. Co. 1, sw nw 17-16-22, lcn.

CRITTENDEN COUNTY — Manning & Martin's Cartright 1, se nw sw 16-7n-8e, no report.

DREW COUNTY — Sloan, Wells et al's Hardy 1, sec nw 3-14-7, rur.

HEMPSTEAD COUNTY—Easton, May & Murdock's R. M. LaGrone 1, ne ne 5-12-26, sdtr, td 2944 ft.

LAFAYETTE COUNTY—Lyons & Neely's L. Taubel 1, se nw 18-16-22, rur.

MILLER COUNTY—F. F. Earles' General American 1, se se sw 20-14-26, rur. Hearell & Burnett's Willie Wallace 1, se nw se 7-20-27, lcn.

OUACHITA COUNTY—A. H. Tarver et al's Dean 1, sw se 16-14-19, spd, dr 2150 ft. O. F. Whittaker's C. C. Guttry 2, se nw 21-15-19, arr make test, td 2180 ft.

NORTH LOUISIANA

BIENVILLE PARISH—DeSoto O&G Co.'s Ashley 2, c sw se 15-16n-10w, ru and sd. Gulf's Goodpine Oil Co. 1, se sw 25-14n-8w, elev 157 ft, massive anhydrite 5303-5420 ft, coring 6865 ft. Hunt-Seaboard's Harrison 1, 2-16n-6w, mim.

BOSSIER PARISH—Union Prod. Co.'s Kerr 1, c se 24-17n-12w, coring 5080 ft (lower Marine test).

CADDO PARISH — Prairie River Synd.'s Hutchinson 1, sw nw 15-15n-12w, elev 153 ft, top lower Marine 8380 ft, top Bodcaw sand 8775 ft, tested sgo 8987-9110 ft, dry abn, td 9141 ft. A. D. Robinson et al's Dickson 1, 22-20n-14w, elev 185 ft, top Nacatosh 870 ft, base chalk 1690 ft, 5-3/16 in csg cmtd 2400 ft, woc, td 2453 ft (Tokio).

CALDWELL PARISH—G. W. Zeigen's La. Central Lbr. Co. 12, 20-14n-3e, spd.

CATAHOULA PARISH—G. E. Foster et al's Peck 1, c s½ 39-10n-8e, woc surf csg.

CLAIBORNE PARISH—W. L. McClanahan's J. T. Lewis 1, sw se 25-20n-7w, elev 400 ft, top Hill 5152 ft, sd 5507 ft. Union Prod. Co. et al's Brownfield 2, c se nw 5-19n-5w, elev 235 ft, top lower Marine 7860 ft, coring 8686 ft; Hawks 1, 1-19n-6w, completed as gasser, si for gauge, td 5741 ft (Travis Peak).

DE SOTO PARISH—Clear Lake Oil Co.'s Woolums 1, nw nw 29-12n-12w, cored sand so, sd for casing, td 2694 ft. Wright, Harris et al's (Kingston Oil Co.), Scott 1, ne ne 32-14n-13w, wosr, td 2778 ft. La. Seaboard's Lawrence 1, sw ne 36-12n-14w, dk.

FRANKLIN PARISH—Southern Star Pet. Corp.'s Grayson 2, sw ne 36-12n-6e, rur.

LINCOLN PARISH—E. T. Oakes, H. D. Easton et al's N. L. Griggs 1, c sw 36-18n-1w, elev 199 ft, top anhydrite stringer 4253 ft, massive anhydrite 4493-4713 ft, cored oolitic lime sg 5173-91 ft, oolitic lime oil stains 5314-26 ft, top Travis Peak 5975 ft, Petitt sand with good resistivity and fair porosity 5932-41 ft, cemtd 5½ in csg 6121 ft, curing titles preparatory to perf csg in basal Glen Rose (Petitt), td 6260 ft, brown shale with slickensides.

MADISON PARISH—Continental Oil Co.'s Singer Mfg. Co. 1, 3-15n-11e, mim.

MOREHOUSE PARISH—H. J. Furlong, Jr. et al's Clark 1, 10-20n-7e, dr 5028 ft.

RED RIVER PARISH—Ark. Fuel Oil Co.'s Franklin Realty Co. 1, c ne nw 20-11n-9w, top anhydrite 4960 ft, coring 6033 ft.

SABINE PARISH—J. C. Sutton Oil Co.'s Sabine Lbr. Co. 1, se nw ne 23-7n-14w, woc 16-in surf csg (10,000 ft test).

TENSAS PARISH—H. M. Jones' Chicago Hill 2, c ne sw 31-12n-10e, sd 750 ft.

UNION PARISH—Joe Modisett et al's Frost 1, ne sw 14-21n-1e, elev 188 ft, top Travis Peak 4050 ft, 9⅝ in csg 4358 ft, top lower Marine 6145-6200 ft, sd 7010 ft.

WEBSTER PARISH—Magnolia's Sexton 1, c sw ne 32-23n-9w, elev 225 ft, 13⅜ in csg 838 ft, top first anhydrite stringer 4175 ft, dr 4420 ft. Lunsford & Ferguson's Turner 1, 20-20n-8w, mim.

SOUTH LOUISIANA

ACADIA PARISH — Gulf's Broussard 1, Midland area, 49-10s-2w, preparing to core 9678 ft.

CALCASIEU PARISH — Republic's Sabine Tram 1, 25-8s-14w, abn 9620 ft. Union Sulphur's American Oil & Sulphur Co. 1, s of Sulphur, 16-10s-10w, sd 8002 ft.

CAMERON PARISH—Humble's Miami Corporation 1, Catfish Lake area, 8-14s-5w, dr shale 8161 ft. Superior's State 1, in Gulf of Mexico, dr shale 8100 ft.

IBERIA PARISH—Texas Co.'s State 2-B, in Vermilion Bay, 20-15s-6e, dr shale 6505 ft.

JEFFERSON DAVIS PARISH—Continental's Fay 1, se of South Roanoke, 31-10s-3w, dr shale 10,412 ft. Humble's Stegall 1, nw of Welsh, 20-9s-5w, abn 9010 ft. Union Sulphur's Calcasieu National Bank 1, Woodlawn area, 12-9s-8w, testing 8281 ft.

LAFOURCHE PARISH—Amerada-Louisiana Land & Exploration Co.'s South Coast 1, Raceland area, 34-15s-19e, woc 9003 ft. Gulf's State PP 3, Timbalier Bay, 36-23s-21e, testing 6964 ft.

ST. BERNARD PARISH—Gulf's State RR 2, in Lake Borgne, 38-14s-15e, sd 5102 ft.

ST. MARTIN PARISH—Shell's Frederick 1, Arnaudville area, 38-8s-5e, sd 9005 ft. Shell-Tide Water's Unit 1, w of Lake Verrett prospect, 11-14s-12e, dr shale 4799 ft. Texas Co.'s State 4, Lake Mongoulois salt dome, 14-10s-9e, dr shale 2998 ft.

ST. MARY PARISH—Shell's Barbour 1, Glenwild area, 21-15s-12e, dr shale 10,250 ft.

TERREBONNE PARISH—Fohs Oil Co.'s Buckley 1, Dulac area, 77-19s-17e, dredging canal; same operator's State 1, La Terre area, 41-19s-19e, driving piling.

MICHIGAN

ALLEGAN COUNTY — Huges Heinig's Lundburg 1, sec 29-3n-14w, dr 500 ft. Adrian Stellard, Tr.'s Schafer 1, se nw nw 29-3n-12w, mim. S. B. Hood's Wright 1, 9-3n-13w, sd 1275 ft.

ARENAC COUNTY—R. L. Hill's Reinhart 1, 25-19n-5e, rig. R. B. Tamblyn's McFarlan 1, 34-20n-3e, lcn. D. F. Jone's Sibley 1, 33-20n-7e, sd 2400 ft.

BARRY COUNTY—Collin & Soper's Simmons 1, 3-4n-10w, mim.

BAY COUNTY—Charles Weller's Dewyer 1, 20-16n-3e, Dundee 3273 ft, sw 3395 ft, sd 3417 ft. Leonard & Olympia's Hossler 1, 9-18n-3e, dr 300 ft. Gulf's Marston 1, 1-14n-4e, Traverse 2040 ft, Dundee 2735 ft, cmt 5-in 2743 ft. Stork Oil Co.'s Century 1, 9-17n-3e, sd 3037 ft. Century Oil Co.'s Wilson 1, 27-17n-3e, dr 2000 ft.

CALHOUN COUNTY — Mar-Cal Dev.'s Woods 1, 13-2s-6w, rig. Verona Crude Oil Co.'s Fruin 1, 29-2s-6w, rig.

CLARE COUNTY—Sun's Weldon 1, 14-19n-3w, dr 3300 ft. Big Basin Oil Co.'s Murphey 1, 26-17n-3w, rig. James McKay's Fee 12, 24-18n-5w, r 1530 ft.

CRAWFORD COUNTY—Dome Oil Co.'s Lindgren 1, 33-25n-3w, Dundee 3187 ft, sw 3369 ft, sd 3371 ft.

GLADWIN COUNTY—W. E. Ross, Tr.'s Kinyon 1, 18-18n-2e, sd 400 ft. Rex Oil Co.'s Ayer 1, sec 22-18n-2e, dr 100 ft. Daily Crude Oil Co.'s Caplan 1, 10-19n-1e, sd 60 ft.

GRATIOT COUNTY — Bliss & Red-Man's Martin 1, 26-10n-3w, dr 1600 ft. Henry Kritzman's Nicker 1, 33-11n-4w, rig.

HURON COUNTY — L. D. Hendershot's Klamp 1, 1-17n-14e, sd 2029 ft. C. W. Teater's Martin 1, 15-15n-11e, fsg 2779 ft.

IONIA COUNTY—Rex Oil Co.'s Marion 1, 11-8n-5w, dr 1700 ft.

ISABELLA COUNTY — Wicklund Dev.'s Lawens 1, 24-15n-5w, dr 70 ft. Cryden & Rowmor's Smith 1, 35-15n-5w, dr 2700 ft. Golden Zabel's Kennedy 1, 25-14n-4w, dr 900 ft.

KENT COUNTY — Hirzel-Leland's Oudermeulen 1, 29-5n-12w, dr 1100 ft.

LAKE COUNTY—Cherry Valley Oil Co.'s Rice 1, 25-18n-12w, sd 1310 ft.

MECOSTA COUNTY—Sun's Robart 1, 29-16n-7w, r 1100 ft. Jetter Drilling Co.'s Deakins 1, 28-13n-7w, dr 100 ft. Frank Hebard's Weeks 1, 32-15n-7w, sd 600 ft.

MIDLAND COUNTY — Sun's Consumers Power 1, 9-16n-1w, rig. Chapman Oil et al's State 1, 27-16n-1w, dr 1000 ft. Daily Crude Oil Co.'s State 1, 29-15n-2e, Dundee 3656 ft, sd 3886 ft. C. W. Teater's Tushingham 1, 26-16n-2w, dr 600 ft.

MONTCALM COUNTY—Socony Vacuum's Hansen 1, 22-12n-6w, rig. H. L. Gentry's Chris-

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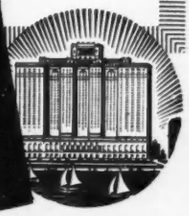

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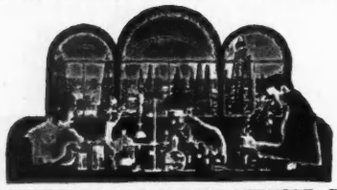
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tensen 1, 29-11n-8w, sd 1255 ft. Hirzel-Leland's Hansen 1, 27-10n-7w, dr 1500 ft.

NEWAYGO COUNTY — Midstates Corp.'s Eichenberger 1, 7-16n-11w, r 3650-3716 ft.

OTTAWA COUNTY—Lentz & Miller's Kok 1, 29-5n-14w, sd 1510 ft. Morris & Sutherland's Brandt 1, 36-5n-14w, sd 1416 ft.

ROSCOMMON COUNTY—Maynard Smith's Eggleston 1, 32-21n-2w, dr 1900 ft.

SAGINAW COUNTY—Bridgport Oil Co.'s Tobias 1, 35-11n-5e, fsg 2490 ft. Weber Oil Co.'s Uebler 1, 9-11n-6e, dr 2800 ft. Hogan, Inc.'s Price 1, 2-11n-1e, sd 2125 ft. Darke Brother's Rockwell 1, 5-11n-3e, dr 1029 ft.

SHIAWASEE COUNTY—W. E. Ross, Tr.'s McCullough 1, 12-6n-3e, sd 1955 ft.

WEXFORD COUNTY—G. H. Schrack's Fee 1, 17-22n-9w, standardizing 1100 ft.

MISSISSIPPI

CALHOUN COUNTY—Ed Spencer's J. C. Conner 1, se ne 12-24n-8e, lcn.

CLAIBORNE COUNTY—Claibourne County Dev. Co.'s Ruth Hayden 1, s½ se 55-11n-2e, elev 199 ft, top Vicksburg 675 ft, top Jackson 935 ft, top Cockfield 1346 ft, sd repr water pump, td 1455 ft, shale, strks sand and pyrites.

GEORGE COUNTY—Cleve Love et al's J. J. Newman Lbr. Co. 2, c sw 9-1s-8w, sd.

HINDS COUNTY—Black River Oil Co.'s Federal Land Bank 1, ne ne 11-15n-5e, elev 146 ft, dr 5690 ft, Wilcox black shale. Cleve Love et al's S. F. Johnson 1, ne se 29-6n-1w, woc 10-in csg 93 ft.

LAMAR COUNTY—Sun et al's Talley 4, se nw 33-4n-15w, elev 374 ft, dr 7810 ft, hd crystalized sand. Southern Miss. Pet. Corp.'s Morris 1, nw se 4-2n-14w, sd 50 ft.

PERRY COUNTY—Phillips Pet. Co.'s J. J. Newman Lbr. Co. 1, se se sw 21-2n-10w, elev 210 ft, dr 5901 ft hd shale.

SIMPSON COUNTY—Goodwill O&G Co.'s Berry 1, se sw 33-2n-4e, sd 365 ft sand.

YALABOUSHA COUNTY—Acme Holding Co.'s S. D. Boyle 1, nw nw 33-25s-7e, elev 285 ft, dr 490 ft.

WEST TEXAS

(This report is confined to the north portion of the Permian basin).

ANDREWS COUNTY—Olney S. Black et al's O. B. Holt-Sun 1, nw nw nw PSL sec D, blk 43, cem cas 200 ft. Wm. F. Hannigan et al's University-Stanolind 1, nwc sec 7, blk 9, lcn. Honolulu Oil Corp.'s J. E. Parker 1-6, ne ne nw PSL sec 6, blk A-44, elev 3212 ft, top anhydrite 1960 ft, top lime 4160 ft, dr 4595 ft. Seaboard et al's Munger-Nix 1, c ne PSL sec 1, blk A-41, sd 315 ft. H. C. Wheeler & E. M. Wahlenmaier's F. E. Gardner 1, c sw sw PSL sec 16, blk. A-35 ,mim.

BAILEY COUNTY—Geo. Etz et al's I. C. Enochs 1, c labor 66, league 182, Floyd C. S.L. sur, elev 3788 ft, top lime 3173 ft, sd in sul w 4160 ft.

BORDEN COUNTY—Continental's Clayton-Johnson 1-A, nwc T&P sec 27, blk 32, T-4-N, elev 2534 ft, dr in sul water 3520 ft.

COCHRAN COUNTY—M. S. Ingleright & E. E. Fogelson's Mrs. N. H. Tarver 2, sec labor 14, league 55, Oldham C.S.L. sur, cem 7-in 4896 ft, td 4900 ft, rust. J. R. Meeker et al's Mrs. D. Slaughter Wright 1, nwc sw labor 26, league 96, Mills C.S.L. sur, elev 3774 ft, top anhydrite 2330 ft, top lime 4105 ft, cored oil stained lime 4865-73 and 4876-89 ft, td 4894 ft, run cas.

DAWSON COUNTY—Ray Albaugh et al's Higginbotham 1, labor 24, league 269, Moore C.S.L. sur, lcn.

FLOYD COUNTY—Mills Bennett's Montgomery 1, nec F. J. Latham sur, 2 A-520, dr 3100 ft.

GAINES COUNTY—American Liberty Oil Co.'s T. L. Wynne, Tr., W. N. Willard 1, swc PSL sec 38, blk AX, top lime 4370 ft, saturation 4962-5000 ft, used 5000 gals acid, flowed 15 bbls per hr; Willard 2 to 4, lcns. Amerada's T. S. Riley 1, c se se W. T. sec 229, blk G, elev 3333 ft, cem 9-in cas 2940 ft; J. B. Robertson 1, c sw sw W. T. sec 196, blk G, elev 3353 ft, top anhydrite 2113 ft, base salt 3092 ft, dr 3450 ft. Fay Boren & Chas. Everst's T. H. Sneed 1, sw W. T. sec 282, blk G, lcn. Continental's A. L. Wasson 1-B, nec se PSL sec ,53 blk A-X, cem cas 4805 ft; Wasson 2-B,SEc se 53, lcn; G. M. Langdon 1-43, nec w½ sec 43, blk AX, mim. Conoco-Amon G. Carter's A. L. Wasson 2, nec PSL sec 48, blk AX, flowed 545 bbls oil and 1,540,000 ft gas initial (natural), td 4985 ft; Wasson 3, sec sec 48, pay 4910-4982 ft, used 4000 gals acid, flowed 961 bbls 35 gravity oil initial; Wasson 4, swc sec 48, td 4974 ft, re-set tubing packer after using 3000 gals acid; Wasson 5, nwc sw sec 48, dr 265 ft; G. M. Langdon 2-44, swc se sec 44, blk AX, mim.Ohio's S. J. Averitt 2, c sw ne W. T. sec 228, blk G, cem sur cas. Phillips-I.T. I.O. Co.'s T. S. Riley 1, nwc sec 345, blk G, dr 4600 ft. Plymouth Oil Co.-A. G. Carter & Conoco's H. Giesecke 1, nwc labor 1, league 296, Reagan C.S.L. sur, elev 3115 ft, title trouble, sd 2130 ft. Shell's R. A. Cox 1, nec sec 380, blk G, CCSD&RGNG sur, elev 3537 ft, top anhydrite 2040 ft, swab 95 percent sul w at 4995 ft, pb to 4962 ft, testing; G. N. Robertson 1, nwc ne sec 344, blk G, elev 3522 ft, top anhydrite 2210 ft, top brown lime 4100 ft, dr 4140 ft.

GARZA COUNTY—M. L. Richards et al's J. B. Slaughter 1, se se se T. T. sec 5, blk 8, elev 2870 ft, dr 3010 ft.

HOCKLEY COUNTY—Gulf's M. G. Gordon 1, nwc PSL sec 12, blk X, mim; Mallet Land & Cattle Co. 1, nec PSL sec 6, blk X, mim. Texas Co.'s Bob Slaughter Blk 2 (6219-ac), sec labor 92, Zavalla C.S.L. sur, league 37, elev 3531 ft, top anhydrite 2222 ft, used 2000 gals acid in pay 4920-4985 ft, flowed 532 bbls oil initial ¾-in choke. Sid W. Richardson et al's Slaughter 1, swc labor 59, league 39, Maverick C.S.L. sur, elev 3547 ft, dr 3630 ft.

LYNN COUNTY — C. H. Hutto et al's Brownfield 1, c E. L. & R. R. sec 6, blk A-1, sd 687 ft. John L. Baldridge et al's Alamo Lumber Co. 1, ne sw sw HE&WT sec 151, 6 mi w New Home, mim.

MARTIN COUNTY — Harris-Anderson Corp.'s Robinson 1, c sw T&P sec 33, blk 36, T-1-N, elev 2776 ft, top anhydrite 1630 ft, top lime 3720 ft, trace oil 4065-58 ft, dr 4210 ft.

LAMB COUNTY—American Liberty Oil Co., T. L. Wynne, Tr.'s A. Neunschwander 1, 660 ft out of sec labor 1, league 660, Capitol Lands top anhydrite 1712 ft, dr 2710 ft.

YOAKUM COUNTY — Bohago Oil Corp.-Bond Oil Corp.'s W. L. West 1, se se se sec 607, blk D, rur. Denver Producing & Ref. Co.'s J. A. Whittenburg Est. 2, c ne ne sec 381, blk D, elev 3623 ft, used 7500 gals acid in pay 4900-5098 ft, flowed 661 bbls 35.2 gravity oil initial, gas/oil ratio 1080/1; Whittenburg 3, rig; Whittenburg Est. 2-A, c ne nw sec 830, blk D, top anhydrite 2220 ft, dr 4450 ft. Gulf's S. J. Dixon 1, sw se se sec 609, blk D, mim. Honolulu Oil Corp.'s R. E. Bennett 2, ne se ne sec 677, blk D, top anhydrite 2360 ft, oil pay 5001-5247 ft, used 5000 gals acid, flowed 549 bbls oil, re-acidized 7000 gals, flowed 735 bbls; Bennett 3, cem 7-in 4907 ft, td 4920 ft, rust. Honolulu Oil Corp.-Cascade Pet. Co.'s Bennett 2, nwc ne sec 678, blk D, rur. J. W. Murchison & L. Fikes' M. B. Sawyer 1, c sw se sec 702, blk D, elev 3623 ft, top anhydrite 2256 ft, top first lime 4100 ft, top solid lime 4665 ft, no shows,abd 5255 ft. Ohio's L. N. Clawater 1, c nw nw sec 638, blk G, cem cas, td 251 ft; Fairman 1, c se se sec 797, blk G, rig. Phillips Drl. Co. et al's W. A. O'Brien 1, nec sec 441, blk D, lcn. E. H. Pitkin & Lou Stogner's J. A. Blades 1, c ne ne sec 103, blk D, elev 3851 ft, top anhydrite 2393 ft, top Yates 3230 ft, top solid lime 4460 ft, first saturation 5198 ft, td 5266 ft, cem cas and tested dry. Shell's Geo. Baumgart 1, sw sec 828, blk D, elev 3587 ft, top anhydrite 2200 ft, top Yates 3020 ft, top solid lime 4470 ft, td 5000 ft, used 4000 gals acid, re-acidized 6000 gals and flowed 486 bbls initial; Baumgart 1-B, se¼ sec 829, spd; Baumgart 1-C, ne¼ sec 866, mim; Ruth Bennett 1, ne se ne sec 677, blk D, top brown lime 4662 ft, td 5259 ft, used 4000 gals acid, flowed 15 bbls per hr, 6 percent b.s&w. J. H. Lynn 1, c sw sw sec 798, blk D, elev 3623 ft, td 4998 ft, swbd dry. Sun's J. H. Lynn 1, c ne ne sec 798, blk G, dr 1110 ft. Texas Co.'s N. W. Willard 1, c sw sw sec 799, blk G, dr 4595 ft; Willard 2, c nw nw sec 799, elev 3613 ft, dr 3650 ft. T. P. Coal & Oil Co.'s Ruth Bennett 3, swc nw¼ sec 678, blk D, cem 7-in 4620 ft. Wynne, Tr.'s Fairman 1, c ne se sec 797, blk D, elev 3627 ft, rig.

SOUTH TEXAS
LAREDO DISTRICT

DUVAL COUNTY—Circle's Southland 1, sec 5, sp. Dovre's Hagist 1, sec 265, partially ru. C. K. Gravis' Frederick 1, Gibson sur, woc 1056½ ft. Frank Gravis' Megerle 1, Broyles sur, ru; Vaello 1-A, td 6018 ft, spraying pure white dist, no oil. Hougen's Patton 1, sur 148, dr 4440 ft. Magnolia's DCRC 1, sur 61, dr 3120 ft; Lopez 1, sur 82, dr 4540 ft. Rudco's Ellis 1, sec 308, prep to reperf after squeeze, td 2970 ft.

McMULLEN COUNTY — Mills Bennett's Nueces 2, sur 234, dr 1045 ft. Cities Service's Morris 1, Perieda sur, still lcn, to start soon after 1-1-38. Howell & Richardson's Martin 2, sec 7, sd 550 ft. Jones' Ezzell E-1, sec 24, mim. Rowan & Nichols' Rhode 2, sec 21, lcn.

STARR COUNTY—Collins & Co.'s Guerra 1, sh 6, dr 6835 ft. Lowe & Ely's Gonzales 1, por 72, woo at contract depth 3020 ft.

WEBB COUNTY—Bridwell's Billings 1, sec

WANTED—Good used adding machine with foot and inch column for tallying pipe. Write South Texas Supply Corp., Three Rivers, Tex.

36, dr 1075 ft. Magnolia's Sprague-Fee 3, sec 2161, coring 2440 ft. Mountain Townsite's Fee 1, sur 786, completing at 1921 ft, 5½ in at 1914 ft.

ZAPATA COUNTY—Bob's Martinez 2, blk 22, pb to 990 ft from 1005 ft, sd. Edwards' Garza 1, blk 96, Douglas subd, lcn.

CORPUS CHRISTI DISTRICT

ARANSAS COUNTY—Atlantic's Porterfield 1-C, McCampbell subd, td 8889 ft, sdtr, td 6887 ft, dr plugs, prep to perf; Porterfield 3-D, lot 6, blk 13, coring 8005 ft.

BROOKS COUNTY — Standard of Texas' Mestina 3 (lse. 2), sh 11, perf 2719-22 ft with 10 shots, flowing 700,000 cubic ft gas, 5 bpd 70 percent sw and est 30 percent oil.

GOLIAD COUNTY — Standard of Texas' Williams 1, Williams sur, sd 2591 ft, engine repairs.

HIDALGO COUNTY—Atlantic's McCalip 1, sec 175, td 9180 ft, 7 in at 8496 ft, 625 ft of 5¼ in to 9070 ft, dr plugs, perforating in sand section 8997-9015 ft. Y. & B. Waite Bros. 1, sh 382, dr 6510 ft.

JIM WELLS COUNTY—Hill's Kuether 1, sur 235, sd 3344 ft. Howell's Goldapp 1, La Vaca gr, mim. Rowan & Hope's Adams 1, Waldron O&G subd, ru. Southern Minerals Hawkins 1, sh 3, San Diego de Abajo gr, dr 2668 ft.

KLEBERG COUNTY — Cisco's Kellam 1, sec 53, dr 950 ft. Magnolia's Dietz 1, sec 7, dr 4875 ft.

LIVE OAK COUNTY—H. & H.'s Nichols 1, Henry sur, sd 60 ft. Holland's Alamo 2, Giminez sur, will mim 1-15-38. Loma's Striddle 1, Turner sur, partly ru and sd acct weather. Ranco's Fee 1, Poitevent sur 3, sd 3905 ft. Hickok & Reynolds' S. A. Joint Stock 1, Henry sur, prep to mim.

NUECES COUNTY—Douglas' McKinzie 1, sur 419, dr plugs 5812½ ft. Renwar's McKinzie 1, McKinzie tr, mim; Morgan 1, sur 413, mim. Richardson's Chapman 1, sec 43, td 5424 ft, cleaning into pits. Southern Mineral's King 4, sec 7, testing 4022 ft. Texon's Horne 1, Palo Alto gr, still drk. Union's Galladay 1, Agua Dulce gr, coring 6785 ft; Simonds 1, Agua Dulce gr, dr 7725 ft.

REFUGIO COUNTY — Shield's Shelly 1, Refugio townsite sur, dr 3150 ft. Union's Power 9, Refugio townsite sur, wshg in 8010 ft.

SAN PATRICIO COUNTY—Bob's Green 2, Williamson sur, coring 6510 ft. Plymouth's Brigham 1, sec 62, dr 2775 ft. Schwab's Lane 1, sec 12-A, sd 3534 ft acct high wtr.

VICTORIA COUNTY—Echols' Dunseth 1, Perez sur, dr 4065 ft. Gulf's Bonner 1, Galban sur, testing 5495 ft. Union's Keeran 8, de Leon sur, reported dr plugs 6512 ft.

WILLACY COUNTY — Magnolia's Armendiaz 1, sh 4, coring 7380 ft.

SAN ANTONIO DISTRICT

ATASCOSA COUNTY—Stieren's Crawford 1, Crawford sur, dr 3855 ft.

BASTROP COUNTY—Bibb's Lentz 1, Wilkinson sur, prep to run csg 2540 ft. Southern Cross' Smith 1, Blalock sur, dr 875 ft.

BEXAR COUNTY—Ball & DuBose's Miller 1, Chhistopher sur, dr 350 ft. Fair's Medina Irr. Farm 1, blk 55, sd for fuel 53 ft. Hickok & Reynolds' Ewert 1, York sur, sd at corrected td 445 ft. Rosenberg's Carle 1, Rolan sur, sd 245 ft, mir.

CALDWELL COUNTY — Mac-Wag-Tree's Roberts 1, House sur, dr 2265 ft. McNeill et al's Marino 2, Allen sur, swabbed sul wtr, sd may dd from 2060 ft.

DIMMITT COUNTY—Teas & Maryland's McKnight 1, I&GN sur, sd 5634 ft sndy sh.

EDWARDS COUNTY—Carter's Sweeten 1, GC&SF sur, dr 5180 ft. Evans & Love's Brown 1, sec 77, dr 4640 ft.

FRIO COUNTY—Amerada's Melms 1, Alexander sur, underreaming 3935 ft.

GUADALUPE COUNTY — Blanco & Buchanan's Howell 1, Darst sur, dr 3065 ft. Kreiter & Douglas' Oliver 1, Smith sur, dr 2370 ft. Newhall's Rosebrock 2, Duran sur, lcn.

MAVERICK COUNTY—Wellington's Chittim A-1, sec 156, drk.

TRAVIS COUNTY—Smith's Morell 1, McHerby Winburn sur, lcn.

WILSON COUNTY — Richardson's Heirholzer 1-A, Salinas sur, ru.

ZAVALA COUNTY — Wilcox's Gilliam 2, sec 11, testing thru perfs 3925-40 ft.

EAST TEXAS BORDER COUNTIES

CASS COUNTY — V. A. Hughes & Co.'s Lyster 1, Wm. Bateman sur, sd 1913 ft.

HARRISON COUNTY—Ark. Fuel Oil Co.'s C. M. Abney 1, Eason Little sur, elev 278 ft, blew out est. 30 mil ft day at 4820 ft (Hill sand), killed, re-bldg dk to dd. Eastern Shrevetex Oil Co.'s Mable George 1, J. S. Powell sur, pumping, wo gauge, td 2505 ft.

PANOLA COUNTY—C. K. Crews' J. C. Graves 1, A. J. McGowan sur, sd 2531 ft. Preston et al (formerly Edwards Drlg. Co.), Rushing 1, Mannan Smith sur, owdd, td 2950 ft.

TEXAS GULF COAST

BRAZORIA COUNTY — Pure's Smith 1, Peach Point prospect, S. F. Austin sur, sd 7710 ft.

CHAMBERS COUNTY — Salt Dome and Standard of Texas' State 1, Galveston Bay, ru.

FT. BEND COUNTY—Medford & Burke's Woods 1, s of Blue Ridge, Magnolia Place subdivision, dr shale 5768 ft.

JEFFERSON COUNTY—J. E. Harwell's State 1, in Gulf of Mexico, spudded. Glen H. McCarthy's Broussard Hebert 1, Cheek area, C. Hillibrandt sur, woc 7732 ft.

MATAGORDA COUNTY — Pierce Estate's Fee 1, n of Van Vleck, I&GN sur, coring shale 7000 ft. Sun's Robbins 1, n of Citrus Grove, G. H. Vandeveer sur, coring shale 8670 ft.

TYLER COUNTY—Navarro Oil Co.'s Rice 1, Warren area, BBB&C sur, sec 11, dr shale 5090 ft.

WHARTON COUNTY—Strake's Strunk 1, Lissie area, L. P. Jennings sur, running electrical logging device 8010 ft.

Motors

Century Electric Company, St. Louis, Missouri, recently published a new 24-page book, which presents information concerning the electrical characteristics and descriptions of all types of fractional horsepower motors, etc.

Steels

Timken Steel and Tube Division, The Timken Roller Bearing Company, Canton, Ohio, presents in its third edition of "Digest of Steels for High Temperature Service" additional data on the selection and application of various kinds of steel for high temperature service.

Meters

National Meter Company, 4207 First Avenue, Brooklyn, New York, in a recent publication describes the widest range of type and sizes of meters for the widest range of application. The Hydro-Measure-Matic Empire meter is described in detail and a complete description of the Microset is contained in this catalog.

GRIZZLY POWERFLEX 10,000 Lb. Test

●

GRIZZLY RED LINE CUB 7,500 Lb. Test

●

GRIZZLY CUB 5,000 Lb. Test

In order to save you time and money as well as to insure perfect installation, users now may order any type of Grizzly Rotary Hose COMPLETE WITH COUPLINGS. Under this plan Grizzly hose is delivered direct to your rig with factory installed couplings and nipples, ready for use. Used Grizzly couplings are cut from the discarded hose and returned for credit. This plan assures perfect installation of genuine Grizzly hose, saves all the time and trouble of installing nipples and couplings at the well, and eliminates possibility of damaging hose. Ask your supply company or your nearest Grizzly branch for price list and detailed information.

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DEPENDABLE—AT DEWAXING TEMPERATURES

-55°F

The relative toughness of steel at low temperatures is an important factor in its selection for equipment used in dewaxing plants. The performance of pumps, centrifuges and similar equipment can be considerably affected by the sub-zero impact strength of the steel in highly stressed parts.

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We will be glad to send detailed information on the low-temperature impact properties of several well-known Molybdenum steels to any one interested. . . . Climax Molybdenum Company, 500 Fifth Ave., New York City.

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NEW PRODUCTS FOR THE FIELD
Machinery • Tools • Equipment

CHAIN FOR PIPE WRENCHES
Billings & Spencer Company

Billings & Spencer Company, Hartford, Connecticut, recently announced an improvement in the chains used on the Billings chain pipe wrenches, having increased the breaking strain pounds of these chains about 40 percent. This increase in strength is attributed to a controlled grain size steel, which is scientifically heat treated to develop the necessary physical properties in the steel.

Each chain has a rust-proofed finish and is equipped with the Billings master link, as well as having a connecting link for other makes of wrenches.

Billings Chain for Chain Pipe Wrenches

DIRECT ROTARY DRIVE
The National Supply Company

The National Supply Company, Toledo, Ohio, announces an advanced departure in the method of driving the rotary table. This new type "B" underfloor drive is an independent drive, which eliminates the former conventional one from the draw works, by driving the rotary table with a separate 9 x 8 steam engine placed below the derrick floor.

One of the chief features of this drive is the elimination of the rotary drive chain across the derrick floor, giving more clear floor space and greater safety. Other features claimed are: less wear on the draw works and on the hoisting engine, better control over drilling operations, less noise and greater economy.

The type "B" drive places the 9 x 8 twin steam engine, with countershaft and rotary machine drive below the derrick floor. The engine has a direct coupled shaft extension on which clutch sprockets are mounted for driving the rotary machine and countershaft. The countershaft is positioned under the draw works and provides a means of transmitting the power of the 9 x 8 engine to the draw works in an emergency, or using the hoisting machine to drive the rotary machine. The chain drive to the rotary machine is enclosed in an oil bath guard. With this drive, a power take-off is provided for driving an auxiliary or stand-by hoist. This is accomplished by placing a sprocket on the opposite of the engine shaft.

The Ideal-Ajax 9 x 8 steam engine used on this drive is a new all-purpose oil country engine, suitable for draw works drive and direct connected pumping drives as well as for direct rotary drives.

An Underfloor View of National Type "B" Direct Rotary Drive.

ASBESTOS SUIT
Johns-Manville

Johns-Manville, 22 East 40th Street, New York, recently announced a one-piece asbestos suit offering many new features for the protection of fire fighters.

With the shoes and body of the garment all in one piece the suit is an improvement over the former jumper and jacket type, since in an emergency it can be put on quickly by simply closing the zipper fastener up the front. Protected from the heat by a special asbestos flap, the zipper also permits a man to be removed from the suit quickly in the event that he is overcome by heat. The suit permits a maximum freedom of action.

Johns-Manville One-Piece Asbestos Suit

A safety hook is attached to the belt line and to this hook a flexible steel cable can be attached to pull the wearer away from a fire if he is overcome by heat.

Another feature is the heat-proof glass which is suspended from the vizor of the hat and therefore stands clear of the face. Also, since the suit is made in one piece, the possibility of losing or misplacing necessary parts of the equipment is lessened.

IRON BODY GLOBE AND BODY VALVES
Crane Company

Crane Company, 836 South Michican Avenue, Chicago, recently developed a line of iron body and angle valves designed to withstand exceptionally severe service. The plug type disc is made of Crane nickel alloy and the body seat ring of Exelloy, a specially heat treated chromium iron. The combination of metals for seating surfaces has been found by extensive tests to offer excellent resistance to wear, temperature, galling and scoring. In addition, these metals are harder, stronger and tougher than metals ordinarily used in iron valves.

These valves are recommended for 150 pounds steam

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SLIP between the spotless sheets on any bed in **Hotel McAlpin.** A deep, SOFT mattress soothes your weary body to sound slumber, to complete relaxation. "Soft as a feather" is really inadequate . . . . should say "SOFTER".

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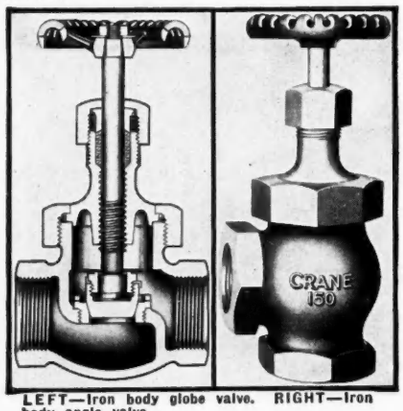
$2.50 SINGLE **$4.00 DOUBLE** **$4.50 TWIN BEDDED**

working pressure and 300 pounds on cold water, oil or gas lines. They are made in sizes ¼ to 3-inch, and also are recommended for throttling service. Interchangeability of parts is a feature.



LEFT—Iron body globe valve. RIGHT—Iron body angle valve.

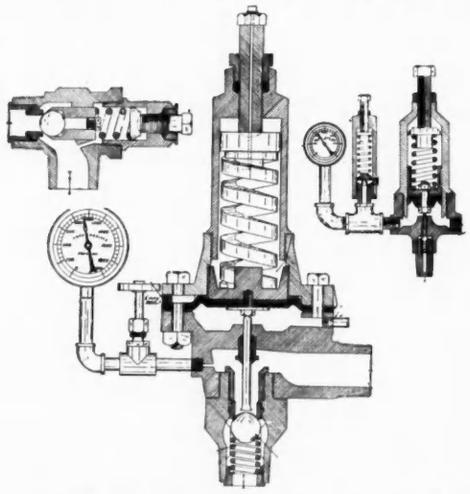
The stuffing boxes are fitted with a gland and filled with high grade packing and may be repacked while under pressure when wide open. These improved iron body valves are identified as 314-½-P globe and 316-½-P angle.

CONTROL UNIT

Acme Regulator Company

Acme Regulator Company, Drawer 268, Tulsa, recently announced the development of a new control unit for extreme high pressure which is made of a heavy gun metal bronze, 6000 pounds test.

The following features are claimed: the valve and orifice is a standard oil-country ball and seat, easy to replace and available at supply stores; the ball valve in service has an oscillating and rotating motion, which feature brings wire



Acme Control for Extreme High Pressure

draw and freezing hazards to the minimum; the diaphragm housing is so constructed that diaphragm blow-outs are eliminated; the regulator is spring loaded for down stream control up to 300 pounds; pilot control will give any down stream range desired; one back pressure valve is included as regular equipment and provides step reduction of high pressures, which is an aid in eliminating freeze and wire draw at valve parts.

NOMENCLATURE MAP

After spending two years assembling information, E. C. Jacobson, McBirney Building, Tulsa, has published a nomenclature map of the United States, showing principal oil and gas fields. The map is on a scale of 40 miles to the inch, measuring 41 by 78 inches. Jacobson was assisted by various state geological surveys in compiling the material, and added several large-scale insets.

Official names of the oil and gas fields of the various states as designated by nomenclature committees are appended to the areas. State capitols, counties, and the principal towns in the more active oil areas are also shown.

This Week with the Industry's EQUIPMENT SUPPLIERS

Executives Completing Plans For New Smith Subsidiary

Production and sales plans for Smith Meter Company, 533 Roosevelt Building, Los Angeles, newly acquired subsidiary of A. O. Smith Corporation, Milwaukee, Wisconsin, are rapidly nearing completion, according to Carl Joys, vice president of the parent organization, and Allan Floyd, general manager of the subsidiary.

"The Smith Meter," said Floyd, "is a highly engineered mechanism for measuring the flow of liquids. As the use of gasoline and other liquid petroleum products has increased tremendously, so has the problem of quick, accurate measurement become more and more acute. In the old days of the petroleum industry the number of gallons was actually measured by hand, but as the industry speeded up, meters began to be employed. These were largely adaptations of equipment used in other industries and served their purpose well. Our new meter is designed primarily and specifically for the petroleum industry, and to give the speed and accuracy required under present day circumstances. One of its features is its low resistance to the flow of the liquid being measured. Also, it is practically impossible for either the meter or its indicating device to be tampered with."

CARL C. JOYS
Vice President A. O. Smith Corporation

These executives then explained that the meter finds many and varied uses throughout the oil industry. It is used for measuring the flow of crude oil and in the refinery for measuring gasoline as well as other liquid petroleum products. At the bulk plant it is used for dispensing to tank trucks; and finally, it is used on the tank trucks themselves, insuring accurate, fair measure in delivery of gasoline to filling stations.

Carl Joys then said, "There is a wide market for this type of meter. We are planning a widespread sales and advertising campaign to the petroleum industry. We are increasing our production schedules and our sales activities."

Howes in Charge of Smith Office in Pittsburgh

A. O. Smith Corporation, Milwaukee, Wisconsin, recently announced appointment of R. L. Howes as manager of its newly opened office at Pittsburgh, Pennsylvania.

Howes, after graduating from Iowa State College in 1911, served the Peoples Gas Light & Coke Company, Chicago, and Studebaker Corporation, on the production staff of both companies. He then spent many years at Fairbanks, Morse & Company in the Southwest, and during eight of these years handled, among other duties, its oil field business through The Continental Supply Company. Later he was transferred to the executive offices of Fairbanks, Morse & Company, Chicago, and devoted his entire time to sales work in the Diesel engine division. During the past three years he was eastern manager of Diesel engine sales for the Worthington Pump and Machinery Corporation, Harrison, New Jersey.

Goodrich Names Sewall Department Manager

William Sewall has been appointed manager of the petroleum sales department of The B. F. Goodrich Company, Akron, Ohio, succeeding J. P. Woodlock, who recently resigned.

Sewall joined the Goodrich organization in October, 1929, when Hood Rubber Company was purchased and became advertising manager of the Hood and Miller tire division. He had been assistant to the tire sales manager and tire advertising manager for Hood at Watertown, Conn.

After four years in associated tire lines merchandising, sales promotion and advertising he was made assistant manager of the Goodrich petroleum sales department with headquarters in New York.

He was graduated from Dartmouth College in 1917, served overseas as an officer in the First Division of the United States Army, entered the rubber business with the Converse Rubber Shoe Company shortly after the armistice and joined Hood in February, 1926.

His headquarters will be in Akron.

ALLAN A. FLOYD
General Manager Smith Meter Company

WILLIAM SEWALL
Manager Petroleum Sales Department, B. F. Goodrich Company.

Oil Well Supply Company Eastern Representatives Confer

Oil Well Supply Company conducted a three-day sales meeting and conference for about 40 machinery salesmen and service men of the firm's Eastern Division at Oil City, Pennsylvania, last week. The event opened with a trip to Keating Summit, Pennsylvania, where the first rotary drilling rig in the east was observed. It is an "Oil-well" steam saving rig driven by an engine taking steam from a steam generator equipped with a super-heater. A study of company products and consideration of production methods occupied delegates during the remaining days of the conference.

Those attending were: D. J. Brown, vice president, Pittsburgh; C. L. Benezette, J. M. Haynes, John Blyth, F. D. Smith and C. E. Meyer, of Mt. Pleasant, Michigan; C. H. Maynard, Muskegon, Michigan; J. W. Bibb, West Branch, Michigan; W. Williamson, Gladwin, Michigan; J. S. Leggette and G. W. Nicklin, Charleston, West Virginia; D. O. Smith, Ellwood Case, M. J. Lowe, Jr., and H. H. Miller, Bradford, Pennsylvania; J. B. Holden and

E. H. Grimm, Washington, Pennsylvania; C. E. Frenier, Logan, Ohio; L. W. Woltz, Columbus, Ohio; J. F. VanNort, Pittsburgh; R. Dyer, Owensboro, Kentucky, and S. H. Jett, Irvine, Kentucky.

The following Eastern Division officials and Oil City plant personnel also attended: A. R. Zelt, works manager; J. M. Post, Eastern Division manager; W. C. Ramsey, Eastern Division machinery sales manager, and C. S. Rila, A. L. Linn, D. M. Hochswender, C. T. Dunn, F. B. Lane, R. R. McAfee, D. Bumgardner, A. R. Nutter; M. E. Nicklin, R. P. Steele, S. E. Wilson, Paul Ziegler, G. F. Goetzinger, and John Pugsley.

Cunningham Promoted by General Electric Company

John F. Cunningham has been made assistant to the vice president in charge of manufacturing, of General Electric Company, Schenectady, New York.

Cunningham, a native of Valley Falls, New York, started his service with the company on August 17, 1901, in the armature department in the Schenectady works. He was transferred to the motor department, and in April, 1904, entered the test department, remainnig there until November, 1906. After completing the test course he entered the turbine production department. Then followed service in the contract section, after which he became assistant to the production manager of the works. Later he was transferred to the staff of H. F. T. Erben, then manager of the works, to follow important government contracts. In July, 1923, he became assistant production manager of the works, and in April, 1928, was named assistant supervisor of production for the entire company. He was appointed supervisor in September, 1931.

C. W. DAVIS
Rocky Mountain States Representative for American Sand-Banum Company.

American Sand-Banum Appoints C. W. Davis Representative

American Sand-Banum Company, 9 Rockefeller Plaza, New York, has appointed C. W. Davis its Rocky Mountain States representative.

Davis will carry a complete stock of the company's products in Casper, Wyoming, where he will make his headquarters. In accordance with the policy of the company, he will cooperate with all supply houses in that area handling the company's products.

National Tube Transfers Jim Boax to Tulsa Office

J. R. Boax, formerly located at the Houston office of National Tube Company as field engineer, has been transferred to Tulsa and made assistant sales agent. J. W. Helmstader is succeeding Boax in the Houston office.

General Electric Gets Contract On Atlantic Tanker

General Electric Company, Schenectady, New York, recently received a contract for the propelling machinery for a second turbo-electric, 18,500-ton welded tanker to be built for The Atlantic Refining Company by Sun Shipbuilding and Dry Dock Company at its Chester, Pennsylvania, yards. The contract includes both the turbines and the electric drive.

The vessel's turbo-electric engines will be designed to develop 5,000 horsepower, giving her a speed of 13.25 knots. Cargo capacity will be 156,000 barrels. Scheduled for delivery in August, 1938, the new tanker and Atlantic's 18,500-ton "J. W. Van Dyke," launched at Sun shipyards in November, will be the world's largest welded ships.

Laminated Shim Appoints Southwest Sales Agents

Laminated Shim Company, Long Island City, New York, has appointed Industrial Sales & Engineering Company, Houston, exclusive agent in the Southwest for the sales of the company's products.

The new agency, headed by J. H. Drapier and W. R. Davis, is well known throughout the oil country and is in a position to furnish prompt service to its customers. The head office is in the Citizens State Bank Building, Houston, and a branch office is maintained at Dallas. A further representative and office is in the Tulsa Loan Building, Tulsa.

Harnischfeger Appoints Riehle Sales Manager

Harnischfeger Corporation, Milwaukee, Wisconsin, has appointed Abbott F. Riehle sales manager of the Smoothare welder and welding electrode division.

A graduate of the University of Pennsylvania with a degree of mechanical engineering, he for 10 years was in charge of the sales and management of Riehle Brothers Testing Machine Company of Philadelphia, which was later taken over by American Machine and Metals, where he continued in charge of sales.

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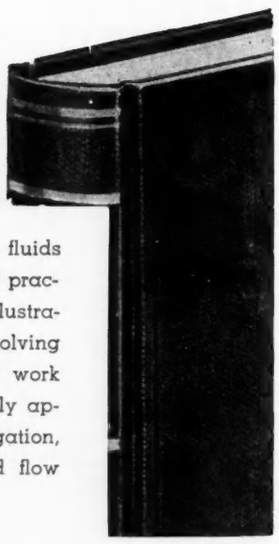
ANALYTIC METHODS FOR SOLVING FLOW PROBLEMS



A complete treatment of the flow of homogeneous fluids through porous media, covering all typical problems of practical interest and laying particular stress upon the illustration of the various analytical methods available for solving flow problems. A needed and specialized reference work for engineers in the oil and gas industries, also widely applicable to the study of hydrological questions, irrigation, dam-construction problems, and those involving fluid flow through refractories and ceramic materials.

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THE FLOW OF HOMOGENEOUS FLUIDS THROUGH POROUS MEDIA

by M. MUSKAT

Chief of Physics Division, Gulf Research & Development Co.

763 pages. 284 illustrations. Price, $8.00

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P. O. Drawer 2811 Houston, Texas

Squeaks from the Bull Wheel

Simple

I've been trying to think of a word for two weeks.

How about fortnight?

Too Much Odds

The famous jockey was taken suddenly ill. His groans so alarmed the trainer that he advised him not to take chances and to visit a doctor.

Later the same day the trainer found the jockey still as sick as ever.

"Didn't you go to see the doctor I told you about?" asked the trainer.

"Yeah, I went to his office," moaned the jockey.

"Well, didn't he do you any good?"

"I didn't go in. When I got to his office there was a brass plate on the door: 'Dr. Kurem, Ten to One.' I wasn't going to bother with a long shot like that!"

All Set

The police inspector was about to raid a gambling den. At midnight, taking his place at the head of the squad of officers, he looked them over closely and then asked his assistant:

"Is everything all set for this raid?"

"Yes, sir," said the assistant. "Our guns are in perfect order, there are the flashlight cameramen, the squad cars are waiting outside and I notified the proprietor of the place this afternoon. All set, sir."

Cured

"I understand that Bette has cured her Scotch boyfriend of stuttering. How did she do it?"

"She called him up long-distance, collect."

Foresight

The salesman had sold everything that was necessary for the furnishing of the lawyer's office, when he had a happy thought.

"Oh, yes, I nearly forgot," he exclaimed; "you need a doormat."

"Fine! But bring me one that is well worn."

Holiday Spirit

There was little work to be done in the office on Christmas Eve, and nobody felt like doing that little. Four of the men finally wandered into one corner of the office and relaxed. They made themselves comfortable, told stories, and laughed every now and then.

The door opened suddenly—and the Big Boss stood before them.

"Gentlemen, gentlemen," he cried, "what's going on here?"

The four men leaped to their feet.

"Is this a time for loud laughter?" the Big Boss went on. "Don't you realize that the rest of the staff is trying to sleep?"

Vanity

"How's that new mare of yours turning out?"

"Oh, I wish now I'd bought a horse. She's always stopping to look at herself in puddles."

Ready for His Train

The big railway terminal was crowded when a shabby individual approached a wicket and peered inquiringly at the young woman on duty behind it.

"Excuse me, miss," he apologized, "but do you represent the Traveler's Aid Society."

"Yes," she replied.

"Den where's de freight yards, please?"

The Unbeliever

"Figures can't lie," said the professor earnestly. "For instance, if one can build a house in 12 days, 12 men can build it in one."

"Yes?" interrupted a student. "Then 288 will build it in one hour, 17,280 in one minute, and 1,036,800 in one second. And I don't believe they could lay one brick in that time."

While the professor was still gasping, the smart "ready reckoner" went on:

"Again, if one ship can cross the Atlantic in six days, six ships can cross it in one day. I don't believe that either, so where's the truth in arithmetic?"

Then he sat down.

What a Pity

A popular society woman announced a "White Elephant Party." Every guest was to bring something that she could not find any use for yet too good to throw away. The party would have been a great success save for the unlooked-for development which broke it up.

Eleven of the nineteen women brought their husbands!

Always on Time

A movie comedy showed a bevy of shapely girls disrobing for a plunge in the "old swimming pool." They had just taken off their shoes, hats, coats and were beginning to—a passing freight train dashed across the screen. When it had passed, the girls were frolicking in the water.

An old railroader sat through the show again and again. At length an usher tapped him on the shoulder.

"Aren't you ever going home?"

"Oh, I'll wait awhile longer. One of these times that train's going to be late."

For the World's Title

Patrons of a restaurant noticed tacked on the wall a sheet of paper which was printed in bold characters:

"The umbrella in the stand below belongs to the champion heavyweight fighter of the world. He is coming right back."

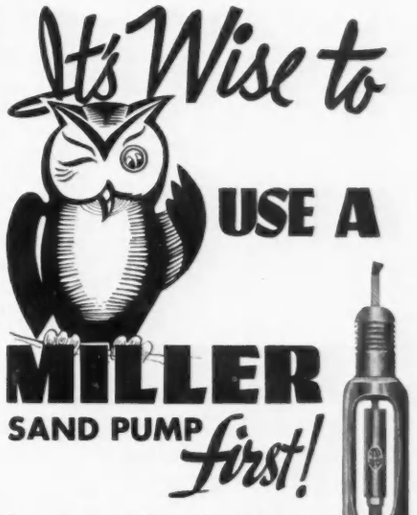
Five minutes later umbrella and paper had disappeared. In their place was another notice:

"Umbrella is now in possession of the champion Marathon runner of the world. He is not coming back."

Oh, My

"Good heavens! There are cannibals on this island!"

"Be calm, my dear—don't get in a stew."



Because sand and sediment in your wells make them poor producers. With a MILLER, the Sand Pump with the powerful suction action you can remove these causes of poor production, quickly at small cost. Get ALL your oil with a MILLER.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type, ¼-inch wall tubes HEAVY Type Sand Pumps.

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To Meet Every Condition

- **BAILER BOTTOM** — With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.
- **SAND BOTTOM** — Used when tools are run and when well is shot to quickly remove loose material.
- **STAR BOTTOM** — Used for cutting the sand loose.
- **CHISEL BOTTOM** (In Pump) — With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

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See Page 1186 COMPOSITE CATALOG

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INDEX TO ADVERTISERS

	Page
J. S. Abercrombie Co.	—
Abercrombie Pump Co.	—
The Louis Allis Co.	—
Ajax Iron Works	—
Allsteel Products Manufacturing Co.	—
Alten's Foundry & Machine Works	—
Aluminum Company of America	—
American Askania Corporation	—
American Assn. of Petroleum Geologists	—
American Chain & Cable Co.	49
American Cable Division	—
American Cast Iron Pipe Co.	—
American Hammered Piston Ring Division of Koppers Co.	—
American Iron & Machine Works Co.	—
American Lubricator Co.	—
American Meter Co.	—
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American Seismograph Co.	—
American Steel & Wire Co.	—
Atlas Ball Co.	—
Atlas Supply Co.	—
Axelson Manufacturing Co.	—
Baash-Ross Tool Co.	—
Baker Oil Tools, Inc.	Fourth Cover
Baldwin-Duckworth Chain Corp.	—
Barber-Green Co.	—
Baroid Sales Co.	—
William M. Barret, Inc.	90
Bartlett-Hayward Division of Koppers Co.	—
Beaumont Iron Works Co.	—
Bethlehem Steel Co.	—
Black, Sivalls & Bryson	—
The Brance-Krachy Co.	—
Braden Steel Corp.	—
Bradford Motor Works	83
Braniff Airways	94
Brauer Machine & Supply Co.	—
The Brewster Co.	6
The Bridgeport Machine Co.	46
Broderick & Bascom Rope Co.	—
Buckeye Traction Ditcher Co.	—
Bull-Stewart Equipment Co.	—
Butler Manufacturing Co.	—
A. M. Byers Co.	4
Byron Jackson Co.	—
Jo H. Cable	90
Calmec Manufacturing Co.	—
Cameron Iron Works	33 to 36
Carlyle Rubber Co.	—
Carnegie-Illinois Steel Corp.	—
Carson Machine & Supply Co.	—
Caterpillar Tractor Co.	23
The Cavins Co.	—
Chain Belt Co.	—
The Chemical Process Co.	—
Chiksan Oil Tool Co.	—
Clark Bros. Co.	—
Clayton Manufacturing Co.	—
Climax Molybdenum Co.	92
Columbian Steel Tank Co.	—
Continental Oil Co.	—
The Continental Supply Co.	—
Fred E. Cooper Co.	—
The Cooper-Bessemer Corp.	—
Crane Co.	—
Cravens, Dargan & Co.	—
Cummins Engine Co.	—
W. H. Curtin Co.	—
Darling Valve & Manufacturing Co.	—
The Dayton Rubber Mfg. Co.	—
Diamond Chain & Manufacturing Co.	—
W. S. Dickey Clay Manufacturing Co.	—
Dixon Valve & Coupling Co.	—
Dodge Manufacturing Co.	—
Dowell Incorporated	—
Eastman Oil Well Survey Co.	—
Economy Electric Lantern Co.	—
Elliott Core Drilling Co.	—
Emsco Derrick & Equipment Co.	—
Eureka Tool Co.	—
The Fafnir Bearing Co.	—
First National Bank, Houston	—
First National Bank & Trust Co. of Tulsa	—
Edwin H. Fitler Co.	—
Fluid Packed Pump Company	—
Foote Bros. Gear & Machine Corp.	—
Fort Worth Clearing House Assn.	—
The Fort Worth Laboratories	90
Franks Manufacturing Corp.	—
Frick-Reid Supply Corp.	—
Gardner-Denver Co.	—
The Garlock Packing Co.	—
Gas Lift Corp.	—
Gaso Pump & Burner Manufacturing Co.	29
General Electric Co.	54
General Power Co.	85
Geological Scientific Service Co.	90
Geophysical Service, Inc.	—
Globe Oil Tools Co.	—
The B. F. Goodrich Co.	—
Goodyear Tire & Rubber Co.	—
H. P. Gott Manufacturing Co.	—
Grant Oil Tool Co.	—
Gray Tool Co.	—
The Guiberson Corp.	—
Gulf Coast Machine & Supply Co.	—
Gulf Envelope Co.	—
Gulf Publishing Co.	—
Gulf States Utilities	—
Gustin-Bacon Co.	—
Halliburton Oil Well Cementing Co.	—
Hardway & Cathey	90
Harrisburg Steel Corp.	—
Harnischfeger Corp.	—
Haynes Stellite Co.	—
Hazard Wire Rope Co.	—
C. M. Heeter, Sons & Co.	—
Hercules Tool Co.	First Cover
Hewitt Rubber Corp.	—
Hinderliter Tool Co.	—
Hoard Exploration Co.	—
The Chas. N. Hough Manufacturing Co.	—
Houston Ready-Cut House Co.	—
Hughes Tool Co.	—
Humble Oil & Refining Co.	—
Hunt Tool Co.	—
Hyatt Bearings Division	—
Ideal Bailer Co.	—
Independent Exploration Co.	—
The Inferno Co.	89
Ingersoll-Rand Co.	—
International Derrick & Equipment Co.	—
International Harvester Co.	—
The International Nickel Co.	—
International Petroleum Exposition	—
International Supply Co.	—
Byron Jackson Co.	—
Jarecki Manufacturing Co.	—
Jeffrey Manufacturing Co.	—
Jensen Brothers Manufacturing Co.	—
Johns-Manville	—
M. O. Johnston Oil Field Service Corp.	—
The S. M. Jones Co.	—
Jones & Laughlin Steel Corp.	—
J. & S. Carburetor Co.	—
The Kennedy Valve Manufacturing Co.	81
Kerotest Manufacturing Co.	—
Kibele Manufacturing Co.	—
Kinzbach Tool Co.	—
Koppers Co.	—
Landis Machine Co.	—
Larkin Packer Co.	Third Cover
The Layne & Bowler Co.	45
LeRoi Co.	43
A. Leschen & Sons Rope Co.	—
The Lincoln Electric Co.	—
Link Belt Co.	—
Lone Star Cement Corp.	3
Lucey Boiler & Manufacturing Co.	—
Neal Lucey Co.	—
Ludlow Valve Manufacturing Co.	—
Lufkin Foundry & Machine Co.	—
McAlpin Hotel	94
MacClatchie Manufacturing Co.	—
D. S. Mair Machinery Corp.	—
Maloney Tank Manufacturing Co.	—
Manhattan Rubber Division	—
F. G. Masquelette & Co.	—
Martin-Decker Corp.	83
The Medart Co.	—
Merco Nordstrom Valve Co.	—
Metric Metal Works	—
Miller Sand Pump Co.	97
Mission Manufacturing Co.	50
Lee C. Moore & Co.	—
National Bank of Tulsa	—
The National Supply Co.	27
National Tube Co.	47
Naylor Pipe Co.	—
The New Deal Specialty Co.	—
Norvell-Wilder Supply Co.	—
Walter O'Bannon Co.	—
O.C.S. Manufacturing Co.	—
Oil Center Tool Co.	—
Oil City Brass Works	—
Oil Well Supply Co.	—
Osage Metal Co.	—
Otis Pressure Control, Inc.	—
Page Steel & Wire Division	—
The Parkersburg Rig & Reel Co.	8
Patterson-Ballagh Corp.	—
Pelican Well Tool & Supply Co.	77
Pennington Signaling Core Barrel Co.	7
Petroleum Electric Power Club	59
Petroleum Rectifying Co. of California	—
Petty Geophysical Engineering Co.	—
Hotel Philadelphian	90
Pittsburgh Equitable Meter Co.	—
Pittsburgh Steel Co.	—
Plowden Supply Co.	—
Preformed Wire Rope	—
Pyramid Manufacturing Co.	53
R-F Electrical Manufacturing Co.	—
Reading-Pratt & Cady Co.	49
Rector Well Equipment Co.	—
Reed Roller Bit Co.	30-31
The Republic Rubber Co.	—
Republic Steel Corp.	40-41
The Rice Hotel	—
Rieber Laboratories	—
The Ridge Tool Co.	—
Rollway Bearing Co.	—
Royal Manufacturing Co.	—
Ryder Scott Co.	—
Jack A. Schley	90
Schlumberger Well Surveying Corp.	—
Security Engineering Co.	—
Seismograph Service Corp.	—
Shaffer Specialty Co.	—
Shaffer Tool Works	—
Shell	—
Sinclair Refining Co.	—
SKF Industries, Inc.	—
A. O. Smith Corp.	—
E. M. Smith Co.	91
Howard Smith Co.	—
South Chester Tube Co.	—
South Texas Supply Corp.	90
Southern Engine & Pump Co.	—
Southern Pacific Lines	—
Spang & Co.	—
Spang, Chalfant & Co.	—
Sperry-Sun Well Surveying Co.	—
Standard Pressed Steel Co.	—
Stanley Tools	—
Star Drilling Machine Co.	—
Stevens Hotel	89
Sullivan Machinery Co.	—
Templeton, Kenly & Co.	—
Texaco Development Corp.	—
Texas Electric Service Co.	—
Texas Electric Steel Casting Co.	—
Texas Iron Works	—
Texas Steel Co.	—
Thermoid Rubber Co.	—
Thornhill-Craver Co.	—
Thornton Tandem Co.	25
The Timken Roller Bearing Co.	—
The Titusville Iron Works Co.	—
Tretolite Co.	—
Trimont Manufacturing Co.	—
Trinity Portland Cement Co.	—
Twin Disc Clutch Co.	—
Union Carbide & Carbon Corp.	—
Union Wire Rope Co.	Second Cover
Unit Rig & Equipment Co.	—
United Gas System	—
United States Rubber Co.	—
United States Steel Corp.	47
United Supply & Manufacturing Co.	—
Universal Atlas Cement Co.	—
Wailes Dove-Hermiston Corp.	—
The Watson-Stillman Co.	—
Waukesha Motor Co.	—
Westinghouse Electric & Mfg. Co.	—
Wheeling Steel Corp.	—
The Wheland Co.	—
Wickwire Spencer Steel Co.	—
J. H. Williams & Co.	89
K. R. Wilson	83
Wilson Manufacturing Co.	—
Wilson Supply Co.	—
W-K-M Co.	39
The Wood Shovel & Tool Co.	—
Worthington Pump & Machinery Corp.	—
Young Engine Corp.	—
Young Radiator Corp.	—
Youngstown Sheet & Tube Co.	63
Zingery Oil Map Co.	90